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AN ANALYSIS OF LABORATORY AND CLASSROOM GROUP FUNCTIONING.

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GROUP FUNCTIONING AND ACTIVITIES WERE STUDIED IN TWO CONTEXTS, THE LABORATORY AND THE REGULAR SCHOOL CLASSROOM. THE LABORATORY STUDY INVOLVED SMALL GROUP PROBLEM-SOLVING IN ARITHMETIC AND IN SOCIAL STUDIES. STUDIES CONSISTED OF GROUP PERFORMANCE, THE RELATIONSHIP OF THE HIGH ABILITY STUDENTS TO GROUP PERFORMANCE, THE RELATIVE IMPORTANCE OF GROUP-PERCEIVED STATUS OF THE HIGH ABILITY MEMBER, THE STATUS IMPROVEMENT OF AN ORIGINALLY UNRECOGNIZED HIGH ABILITY MEMBER, SATISFACTION OR EFFICIENCY OF GROUP ACTIVITY, THE RELATIONSHIP OF INDIVIDUAL NEEDS AND ROLES TO GROUP EFFECTIVENESS, AND THE RELATIVE IMPORTANCE OF SOCIOECONOMIC STATUS TO GROUP EFFECTIVENESS. THE CLASSROOM STUDY WAS DESCRIBED AS AN EX POST FACTO EXPERIMENT, THAT IS, THE EXPERIMENTER ARRIVED ON THE SCENE AFTER CONDITIONS HAD TAKEN PLACE AND EFFECTS HAD OCCURRED, PROCEEDING FROM EFFECT TO CAUSE. MEASURES FOR SUCH INDEPENDENT VARIABLES AS TEACHER LEADER BEHAVIOR, TEACHER INFLUENCED AND ATTRIBUTED POWER, STUDENT ABILITY AND NEEDS FOR ACHIEVEMENT, AND STUDENT AFFILIATION AND POWER WERE ENTERED INTO MULTIPLE CORRELATION ANALYSES TO DETERMINE THE OVERALL PREDICTION OF THE DEPENDENT VARIABLES (EFFICIENCY AND EFFECTIVENESS) FROM THE INDEPENDENTS. THESE TWO PROJECTS WERE FUSED INTO ONE PROGRAM BECAUSE OF SIMILARITIES OF VARIABLES UNDER INVESTIGATION. THE RESULTS OF BOTH WERE CONCEPTUALIZED INTO FUNCTIONAL RESEARCH DIMENSIONS. (JH)

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CHAPTER ONE

The Development of the Research

The studies which are reported in the next two chapters of this volume stemmed from the individual research interests of the two investigators. In Chapter II the reader will find an account of the processes and outcomes of small groups of elementary school children engaged in problem solving. Chapter III relates observed differences between classes which elementary teachers rate as productive and enjoyable to work with, and classes which teachers rate as ineffective.

Each of these two chapters can be read as being independent of the other, and of the first and last chapters of the report. To some extent, in fact, they must be so considered, inasmuch as each undertakes to answer some specific questions about, in the first case, the functioning of small groups of pupils involved in face-to-face operations, and, in the second case, about the operation of total classes of elementary school pupils.

However, the investigators had in mind some additional issues and questions at the time this investigation was planned; questions which dictated that the research should be conducted and interpreted within a common framework, rather than as two totally independent investigations.

The next several paragraphs are devoted to an effort to report the circumstances which led to the inclusion of both studies under a single rubric. This account, in large part, is external to the project itself, but important, in our opinion, because it is indicative of the conditions under which potentially fruitful syntheses of social science principles may occur. The ensuing discussion, then, is essentially a case report of the circumstances which led to the decision to try to integrate the two studies. That account is followed by a more detailed one of the individual and collective goals established for the research reported in the next two chapters. This chapter then concludes with a statement of the problems which the final chapter of this report is asked to answer, and some of the obstacles standing in the way of answering those questions.

Decision to Integrate the Studies

At the time that the decision was made to apply to the Cooperative Research Division for funds to help support the research, the investigators shared different but related interests in research on groups. One of us was primarily interested in the operation of small groups; the other in classroom groups. However, these interests were not as disparate as might appear at first glance, for the interest in small groups was focussed specifically on problem solving groups as they might be found in the elementary school classroom. In effect, our interests overlapped two kinds of groups with which the elementary teacher is in constant daily contact, and about which she has many intensely practical questions. Thus, while the two interests clearly can be identified with two different traditions in psychological research, small group laboratory research versus ex post facto study of naturalistic groups, from an educational point of view, the fact that both kinds of groups are important in teaching provided a point of contact between the two.

A second observation which led to the ultimate decision to combine the inquiries was that the functioning of different kinds of groups might be analyzed in terms of the same concepts. For example, Riecken and Homans (1954), drawing upon an earlier formulation by Barnard (1938), suggested that human groups must solve problems of effectiveness and efficiency if they are to continue operation. The following statement from Riecken and Homans is particularly instructive for our discussion. "Effectiveness refers to the degree to which a group achieves its group purposes, and efficiency refers to the degree to which the group provides satisfactions to individual members. This kind of analysis applies to small groups just as much as it does to larger enterprises." (Riecken and Homans, 1954, p. 805)

With concepts like the above in mind, it seemed to the investigators that there was an additional degree of comparability between the two kinds of groups. That is, not only were they similar in an educational context, but, by virtue of the fact that both were human groups, their functioning could be analyzed in terms of effectiveness and efficiency.

Once it was clear that the groups were comparable, at least conceptually, in this regard, very good reasons appeared to be evident for combining the investigations. Considered independently, each of the studies would make a contribution to our knowledge about group functioning by specifying some of the determinants of effectiveness and efficiency of either class groups or small groups. But by considering groups of both kinds in a related way, additional questions could be posed and, hopefully, answered.

There were two major questions suggested by this integration at the planning stages of the research.

(1) How do effectiveness and efficiency differ operationally between the two kinds of groups with which we are involved?

(2) To what extent is it possible to generalize the findings about one kind of group functioning to the other?

With respect to the first question, effectiveness of a small problem-solving group was defined operationally as the number of problems solved correctly by the group. In the classroom groups, effectiveness was defined in terms of the teacher-judged accomplishment of the class.

One hypothesis regarding the determinants of the effectiveness and efficiency of classroom groups relates the functioning of the group to the mean I.Q. of its members. No such hypothesis is stated in the study of small groups.

Instead, productivity of the problem solving group was hypothesized to be correlated with the performance of the most able member of the groups. In a similar fashion, hypotheses about the functioning of small groups in action have a comparable form when the classroom group is the frame of reference. The wording of the hypotheses changes from one locus to the other, and frequently, as illustrated above, the means by which the variables are measured. As we will indicate in detail in chapters two and three the comparable variables include such concepts as status, motivation, ascendancy, mental health, role, and congruency in personality and role.

The changing nature of the urban community and the large amount of educational and psychological research on middle class children suggested that we contrast group functioning in both a middle and a lower socio-economic community. Our exploratory attempts in this kind of replication have raised, as we indicate in chapters two and three, a number of leads for research regarding the culturally deprived child in the classroom and the small group.

The second question, concerning the interpretability of the results from one kind of group to the other, is one of the central issues considered in the final chapter of this report. As we attempted to conceptualize the relationships between the small laboratory type group experiment and the large naturalistic classroom type group we found that the issues were considerably more complex than we had first imagined. Ultimately we produced models dealing with the larger issues of the interrelationships among theory, practice, and research.

CHAPTER TWO

The Laboratory Study

The laboratory phase of this investigation attempted to solve a series of problems concerning group functioning which the researchers considered to be of both practical and theoretical interest and importance. These problems all revolved around the operations of small (3-member) groups of children brought together for the purpose of solving cooperatively tasks typical of those which confront pupils in the elementary school. The hypotheses tested in this investigation dealt with the conditions believed to invluence the effectiveness* and efficiency* of small problem solving groups. These hypotheses, and the circumstances under which they were generated, will be presented subsequently.

BACKGROUND OF THE STUDY

Several years ago, one of the investigators reported the results of an experimental study of group problem solving of 5th grade pupils (Hudgins, 1960). That investigation was designed to provide information about two major questions: (1) Why do groups of people engaged in solving problems typically produce solutions superior to those of individuals who are comparable in ability, but working by themselves? and (2) Will the superiority achieved by such groups transfer to the individual members; i.e., does learning occur in the small group which enables its members, when subsequently working in isolation, to solve problems more effectively than they were able to do before the group experience?

In order to find answers to these questions, four experimental conditions were instituted. A total of 32 subjects were assigned to each of the 4 conditions.

A: Groups with specification: Four-pupil groups worked together to solve a set of arithmetic problems each day for 3 consecutive days. The specific problems worked on differed from day to day. The members of each group were asked to indicate how they arrived at their answers by following a specified problem solving procedure. It was predicted that the greatest number of correct solutions, and the highest degree of transfer from group to individuals, would occur in these groups. These predictions were based on the assumption that interaction among group members is necessary both for reaching problem solution, and for any learning by individuals to occur. By structuring the interaction pattern, it was hoped that both these dimensions would be maximized.

B: Groups without specification: As in the "A" condition, eight groups of four pupils each worked cooperatively on problems. The amount and type of interaction among members of these groups was left free to vary.

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* The terms effectiveness and efficiency are used here, and throughout this report, with the general meaning assigned to them in the first chapter. Specific meanings, and the operations used in measuring them, will be presented in the body of the report.

C: Individuals with specification: This condition was intended principally as a check on the function of the group. In the event that the group plays essentially a proctoring role (eliminating careless errors, etc.) the specification condition might serve this function for an individual as well as a group would.

D: Individuals without specification: This was a control condition, allowing for the possibility of taking into account any practice effects accruing over the three days of the experimental trials.

At various periods following the experimental treatments, all subjects were given a fourth set of problems comparable to the first three. This time, each subject worked under the "D" condition; i.e., he worked by himself without having to specify (in any formal sense) the cognitive steps through which he passed en route to his answers.

Over the three experimental days, there were significant differences between groups (conditions A and B combined) and individuals (C and D combined) in the number of problems correctly answered. As expected, the groups scored better. However, the non-specification groups (condition B) accounted for this significance.

When the post-experimental scores were analyzed, no significant differences occurred among subject in the various experimental conditions.

Thus at the end of the experiment it was concluded that, although groups solved their problems better than matched individuals, the process by which this superiority occurred had not been discovered (i.e., it was not explained by the interaction hypothesis formulated), and that no transfer occurred from the group situation to the individual condition, at least no transfer which could not be explained simply as a function of practice on relevant tasks. Question 2, then, had been answered. As far as could be determined, no learning went on in the groups on which individuals could capitalize to solve their own problems. The first question, however, had not been answered, or rather, only negative and indirect evidence had been established. It was partly from the experience of conducting the first suudy, and partly from the post-facto analysis of the data of that investigation that the hypotheses of the research being reported in this chapter were developed.

Afterthoughts concerning the first experiment, together with examination of the data, led down two related paths toward the design of the present study. From the two facts that the group superiority could not be accounted for by interaction as defined in the study, and that no transfer attributable to the several group experiences had resulted, a tentative hypothesis was formulatd that the apparent group superiority was an illusion, and one which could be accounted for by the contribution of the most able member of the group; most able, that is, with respect to the activity engaged in by the group. If this were true, it would explain two puzzling phenomena: the "group effect" and the absence of transfer. Theoretically what must happen in problem solving groups, then, is that the most capable member simply communicates the solution to his colleagues. Joint problem solving of the kind envisaged in the original study would probably rarely occur, and consequently the less able members of the group would learn little or nothing which they could apply independently. As a rough check on the utility of this hypothesis, the pre-experimental arithmetic test score of the most capable individual in each group was located. Since this test was not the same as the tasks employed in the experiment, it was not possible to make a direct comparison between the score of the individual and the group accomplishment. However, by inspection, it was clear that these scores were correlated, thus lending confidence to the hypothesis.

A second after-the-fact analysis of the first groups led to the development of another hypothesis. Informal analyses of the operations within those groups had revealed that group members, at least in some instances, met with differential success when they attempted to communicate solutions to the other members. The extremes, as best they could be deduced from informal and non-systematic notes, involved at one end the individual whose solution was immediately accepted, and at the other, the pupil whose answer was greeted with skepticism, and who was forced to prove his argument before his peers were convinced. It seemed likely that these response differences in the groups were the result of the status ascribed to the subject suggesting the solution. Thus, perhaps not only the ability of the members was important for the effectiveness of the group, but the awareness of others of his ability was also of some consequence. It was speculations of this sort, which could be resolved only by further investigation, combined with a continuing interest in the determinants of effectiveness and efficiency of small groups that led to the present laboratory study.

The balance of this chapter is separated into four discussions. First, there is the presentation of the theory underlying the investigation, and a statement of the hypotheses presented for testing. The second and third sections each deal with the design, methodology, and results of experiments. The third section is essentially a replication of the second, except that the experimental task was varied from arithmetic problems to social studies problems. The final section is an analysis of the total experiment, involving comparisons and contrasts between the two replications. It also attempts to draw implications for the classroom, and for future research.

THEORETICAL ANALYSIS

The study of small human groups is obviously important, as well as an exciting arena for the social scientist to develop and test his ideas. Both in formal and informal social situations, decisions are made, problems are resolved, through the action of small groups. This seems to be true of most of our social institutions: the family, business and industry, the school, and the military, as well as clubs, dormitory groups , and so forth.

In the elementary school classroom, for example, teachers have for years made use of small work groups of pupils or committees for many purposes. Often these groups are, both in structure and function, reminiscent of those used by early social psychologists investigating the phenomenon of social facilitation. In reading classes, for instance, one will often find a group of pupils gathered together, each involved in the same task, but working independently of the others. The hum of activity, the general productive air of the others is intended to, and no doubt succeeds in helping each pupil keep his nose to his respective grindstone. These aggregates of individuals compose a group only in the broadest sense of that word, and, in fact, usually fall short of the essential meaning of the term.

More typical instances of group operation in the elementary classroom are found when pupils come together, or are brought together for the purpose of attacking and resolving common problems. This may be done in many ways, too numerous to mention here, but each particular instance may meet the criteria of a group as expressed some years ago by Homans (1950).

> "We mean by a group a number of persons who communicate with one another often over a span of time, and who are few enough so that each person is able to communicate with all the others, not at secondhand, through other people, but face-to- face."
> (Homans, 1950, p. 1.)

The present investigation was concerned with small groups of this order. By studying the effectiveness and efficiency of problem solving groups of children, the researchers hoped to contribute knowledge to two areas; to the classroom, insofar as teachers are concerned about the operations of pupils working together on school tasks, and to small group theory and research.

The Concepts and Rationale

At the most general level, the experiments to be described later in this chapter deal with the question, "What are the conditions which control the effectiveness (productivity) of small groups, and their efficiency (satisfactions to individuals) ?"

Two suggestions (detailed in the preceding section) had grown out of an earlier small group study. At first blush the two ideas appeared to be somewhat contradictory; that is, the most able group member being responsible for the productivity of the group on the one hand, but the status of the contributor controlling the acceptance of his solutions, on the other. This apparent contradiction rested on the assumption that ability and status are perfectly and positively correlated. Reflection immediately suggested that this need not be true. It would not be true, for example, in newly formed groups where the members are unacquainted with each other. Also it was conceivable that within well-established groups, there might be capable members who had never succeeded in communicating their ability to others. This possibility was in itself an interesting question, and one which will receive attention in the later discussion.

In the operations of small groups brought together to solve school type problems, it would be expected that the greatest contribution to effectiveness would be made by the most able group member, and particularly where his ability is discriminably superior to the others in the group. This does not mean that other group members serve no function

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in realizing the group's goals, but it does seem likely that their unique function will be different from that of the pupil who from this point on we shall refer to as the high ability subject (HAbS) . Other group members are, by definition, subjects of average ability (AvAbS) on the task confronting the group.

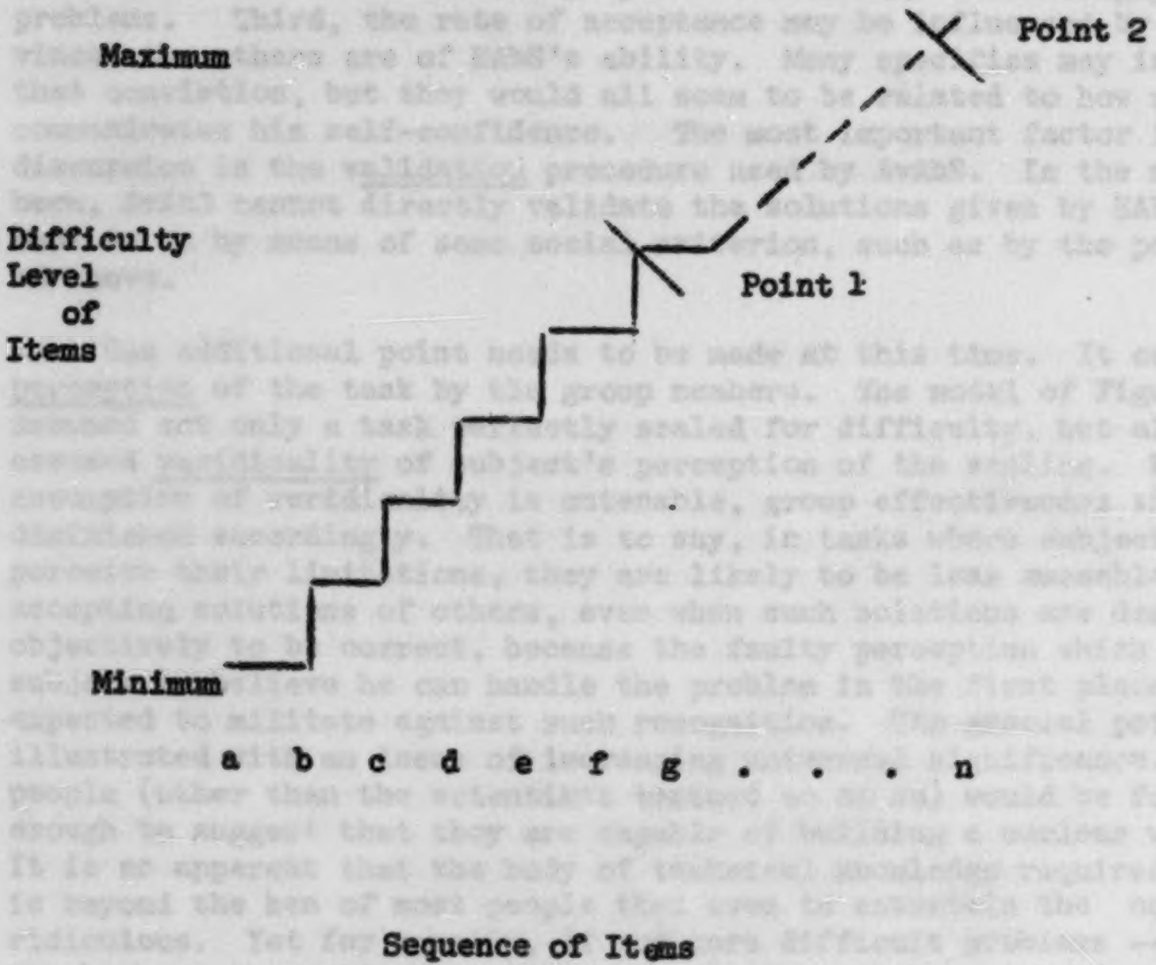
For purposese of developing the theoretical discussion, let it be assumed that an ideal group of three persons is composed of one HAbS and two AvAbSs. Let it also be assumed that the task of the group is a series of problems perfectly scaled for difficulty, so that the first item is of minimum difficulty, each subsequent item increases by one step in difficulty to the last item which is of maximum difficulty. The concept of perfectly scaled ability is also of theoretical importance because it implies an overlapping of the AvAbSs by the HaAbS. That is, each item which can be passed by AvAbS can also be passed by HAbS, but the converse is not true. This ideal situation can be diagrammed as follows (See Figure 2.1) and several observations follow from it.

Insert Figure 2.1 about here

To follow Figure 2.1, any of the members can solve problems a through f. Who actually does so may be important for group efficiency and the group's later functioning, but it matters little if at all in terms of the practical criterion of obtaining the correct problem solution. Any of the three members can do so. However, HAbS can solve not only a through f, but many additional problems as well. Thus, again in this idealized model, the unique function of HAbS is to employ his ability to solve problems.

Since the group structure demands concensus about a solution before it can be accepted, an unusual and a quite difficult role is imposed upon AvAbSs. It is essentially the role of allowing the most capable member to exercise his ability, but at the same time not falling into the trap of blindly accepting whatever HAbS suggests or would legislate. This role entails several steps: (1) recognizing the contribution HAbS can make (2) helping to insure that he makes it as effectively as possible. To do this probably means imposing a review or check of solution processes on HAbS. While ostensibly such a review would serve the purpose of demonstrating solution adequacy to AVAbS, in terms of the model suggested here, its purpose would really be to enlist HAbS's best ability.

One of the most intriguing questions in group problem solving research concerns the recognition of the most capable member (HAbS). While in most practical situations, the concept of perfectly scaled ability will not apply absolutely, it does help to clarify the issue. Suppose that the ideal group of the earlier illustration has now completed problems "a" through "f", and that each of the members has contributed equally to their solution. When confronted by problem "g" and by subsequent problems, the two subjects of average ability will be unable to propose workable solutions, but HAbS is still working within the limits of his ability. When HAbS suggests a solution, what conditions can influence AvAbS's acceptance of it? First, acceptance of HAbS's


Point 2
Maximum
Difficulty Level of Items
Point 1
Minimum
a b c d e f g . . . n
Sequence of Items

1. Point beyond which AvAbS fails all items.
2. Point up to which HAbS passes all items.

Figure 2.1. Theoretical relationship between ability of subjects and contribution to solution of joint tasks.

solutions should come more easily if he had high status prior to the formation of the group; i.e., if AvAbSs had earlier acquaintance with him as a bright student. Second, if HAbS is not initially perceived, his solutions should meet with diminishing resistance, perhaps merely because he is the only member who can propose solutions to increasingly difficult problems. Third, the rate of acceptance may be influenced by how convinced the others are of HAbS's ability. Many specifics may influence that conviction, but they would all seem to be related to how well HAbS communicates his self-confidence. The most important factor in this discussion is the validation procedure used by AvAbS. In the model used here, AvAbS cannot directly validate the solutions given by HAbS, so he must do so by means of some social criterion, such as by the points listed above.

One additional point needs to be made at this time. It concerns the perception of the task by the group members. The model of Figure 2.1 assumed not only a task perfectly scaled for difficulty, but also assumed veridicality of subject's perception of the scaling. Where the assumption of veridicality is untenable, group effectiveness should be diminished accordingly. That is to say, in tasks where subjects do not perceive their limitations, they are likely to be less amenable to accepting solutions of others, even when such solutions are demonstrated objectively to be correct, because the faulty perception which leads the subject to believe he can handle the problem in the first place would be expected to militate against such recognition. The general point can be illustrated with an issue of increasing universal significance. Few people (other than the scientists trained to do so) would be fool-hardy enough to suggest that they are capable of building a nuclear weapon. It is so apparent that the body of technical knowledge required to do so is beyond the ken of most people that even to entertain the notion is ridiculous. Yet for equally, if not more difficult problems -- to ban the bomb or to continue testing -- most of us do have answers. We do not as clearly recognize the expertness required to solve the latter problem intelligently as we do in the former case.

Efficiency, or the satisfactions derived by individual members of the group, should depend not only upon how well the group achieves its purposes, that is, the effectiveness of the group, but also upon the role the individual plays in the group, and how well his personal and social needs are met by that role.

The Hypotheses

The hypotheses tested experimentally are presented here in general form. Each was tested under two task conditions: arithmetic and social studies problems. The procedures used to test them and the results of each will be presented in the next two sections of the chapter.

1. The problem solving effectiveness of small groups is related to the ability of that member of the group who ranks highest on the ability relevant to the successful solution of problems.

2. Group effectiveness is also related to the group-perceived status of the high ability member.

3. The status of an originally unrecognized high ability member will improve over time.

4. The satisfaction (efficiency) derived from the group activity depends upon the relationship between the members' role in the group activity and the rewarding of such behavior by other members of the group.

5. Discrepancies in individual personality needs and social roles also relate to group effectiveness and efficiency.

6. Socio-economic status is related to group effectiveness and efficiency.

SMALL GROUP PROBLEM SOLVING IN ARITHMETIC: EXPERIMENT I

In order to test the hypotheses stated above, a total of 24 groups containing three members apiece were composed. Each group was given the same task which was to solve cooperatively as many as possible of a set of 30 arithmetic problems. Twelve of the groups were drawn from the schools in middle class neighborhoods (such groups were designated HSES for higher socio-economic status) and twelve from schools in lower class neighborhoods (LSES).

All the groups contained one high ability subject (HAbS) and two subjects of average ability (AvAbS). Within each socioeconomic area, 6 of the groups contained HAbSs who were perceived as such by their peers. The HAbSs in the other 6 groups were not recognized (non-perceived) by their group mates at the outset as superior in arithmetic ability.

CONSTITUTING THE GROUPS

All 3 members of each group were drawn from the same class. Practical as well as technical considerations made the arrangement necessary. Class schedules would have made it difficult to draw children from two homerooms at the same time, and it was clearly impossible to ask pupils from different schools to participate in the same group. Since pupils in groups where HAbS was perceived had to come from the same classroom, it seemed advisable to impose this restriction on all the groups, although beforehand the experimenters were dubious about the prospects of locating non-perceived HAbSs under such circumstances.

To constitute the experimental groups, pupils in participating classes were administered the Arithmetic Reasoning Section of the Stanford Achievement Test, Form J. This test consists of 30 word problems graded in difficulty. A variety of sociometric data was collected at the same time. For the experiment attention centered on nominations by classmates of the "3 or 4 pupils in this class who are best in arithmetic" and the "3 or 4 pupils in this class who are poorest in arithmetic".

For each class separately, means and standard deviations were computed for the arithmetic scores and the sociometric nominations on arithmetic ability. In order to qualify as a high ability subject (HAbS) a pupil had to score on the arithmetic test at or beyond 1 standard deviation above the mean for his group. Thus, if the class mean were 14.75 and the standard deviation were 3.25, a pupil had to score 18 or more to be identified as HAbS. Average ability subjects (AvAbS) in each class were those who scored as closely as possible to the mean. In this illustrative class, pupils with scores of 14 or 15 would be so designated.

Whether a pupil identified on either of these dimensions would be included in the study depended upon meeting an additional criterion. The sociometric ratings of potential HAbSs were first inspected. If such a pupil received sufficient nominations as a good arithmetic student to place him 1 σ above the mean for his class, he was identified as a *perceived* HAbS. HAbSs who were rated below the mean were described as *non-perceived*. Pupils who met the first criterion but not the second were dropped from the sample.

Similarly with AvAbSs; to be included in a group with a perceived HAbS, the AvAbS must have nominated HAbS as one of the best arithmetic pupils in the group. For inclusion in a group with a non-perceived HAbS, the AvAbSs must *not* have given him a positive nomination. Preferably they nominated him negatively, although this criterion was not held too rigorously.

The criteria may be briefly presented in tabular form.

Insert Table 2.1 about here

EXPERIMENTAL PROCEDURES

Each small group of pupils was taken from its regular classroom to a different location in the school where the children and the experimenter could work uninterruptedly. These "laboratory" sites varied from supply rooms to temporarily vacated teachers' lounges, depending upon the facilities available in the building.

Before groups were called to the experimental room, the experimenter (who in all cases was one or the other of the two principal investigators; sometimes both) had arranged 3 desks in a semi-circle, placed problem materials on the desks, and inserted a fresh tape on the tape recorder whose microphone was located centrally among the three subjects. When the group members entered the room they were asked to be seated, and were given a brief explanation of what was to occur. They were told that today they would work on arithmetic problems similar to the ones they had done before (the pre-test), but that this time the 3 of them were to work together to get as many right as they could. The group was instructed that each problem should be read aloud, and that, since the session would be tape recorded, individuals should give their first name before speaking. A minute or two was then spent in allowing children to say a few words into the microphone, and hearing their voices as they sound to others. This, of course, was simply an effort to encourage the children to behave naturally during the experimental session. Throughout the session the experimenter remained in the room,

TABLE 2.1

Criteria for Inclusion of Subjects in Experimental Samples

Subject	**Experimental Conditions**			
	Perceived		**Non-Perceived**	
	Arithmetic Score	**Sociometric Score**	**Arithmetic Score**	**Sociometric Score**
HAbS	**1σ above M**	**1σ above M**	**1σ above M**	**-**
AvAbS	**M**	**positive nomination to HAbS**	**M**	**negative nomination to HAbS or no nomination**

taking notes on the group operation and controlling the tape recorder. To what extent the constant presence of both monitors (the experimenter and the tape recorder) limited the spontaneity of the groups can only be guessed at. There was considerable variation among the groups, suggesting differential effects. There is a casual impression that the groups of younger pupils appeared more inhibited by these forces than did the more mature groups.

The procedure followed was the same with all the groups, regardless of their grade level or composition with regard to HAbSs status. The task was a set of 30 arithmetic problems (Stanford Achievement Test, Arithmetic Reasoning, Form K) reproduced by mimeograph to remove the impression of a standardized test. *

Groups were told that they were to agree on a single answer to each problem before they advanced to the next, and that if they did not agree immediately, they were to discuss the problem until their differences were resolved.

No specific time limit was set. Since groups obviously require longer to complete such a task than individuals do, it was intended to allow the groups as much productive time as they required. On the average, groups consumed about an hour. Because the test items employed do increase in difficulty with fair regularity, the investigators decided to halt the group after 5 consecutive problems had been missed. It did not appear likely that the total score of any group would suffer as a result of this procedure.

RESULTS

The test of each of the hypotheses will be presented separately.

Hypothesis 1:

This hypothesis stated that the effectiveness of small problem solving groups is attributable to the contribution of the most able member of the group. In order to test this hypothesis data were available on 40 such groups. Sixteen groups, undifferentiated for the status of the high ability member, had originally been run to provide a test of the hypothesis. However, since the results of the 24 groups required by the basic experimental design were appropriate for the first hypothesis, it was decided to combine all groups for a single test of this hypothesis.

When a comparison is made between the mean scores of the 40 HAbSs and their respective groups, no significant difference results. The mean difference between the high ability members and their group scores is .60 which is not significant, as shown by the data in Table 2.2.

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Insert Table 2.2 about here

The hypothesis is retained. Based on the present sample, at least , the group achievement can be explained in terms of a single member's contribution. In the final section of the chapter, additional data will be presented which bear upon the roles of the various members of the groups under differing task and status conditions. Although HAbS is not the whole story in group arithmetic problem solving, the centrality of his role in such groups will be clarified.

Hypothesis 2:

The second hypothesis in this investigation predicted that group effectiveness would be influenced by the status held in the group by the high ability subject. Groups in which this subject was recognized as most capable beforehand were expected to be more effective than the groups in which HAbS was non=perceived. The reasoning which lay behind this hypothesis concerned the facility with which solutions would be accepted by the group. In simplest terms, it was thought that in groups in which the HAbS was recognized, rather clear cut channels for decision making would exist, and that in cases of disagreement, HAbS would probably serve as arbiter by concensus.

On the other hand, where HAbS's talents were not recognized, there should be much less facility in deciding on solutions, particularly beyond the point at which the members of average ability are able to validate solutions in an objective way. In such groups, the average ability members may prefer to accept their own solutions, even though they are uncertain of their accuracy. Certainly coincidental responses (coalitions) would be likely to carry the day ("John and I both have the same answer, so it must be right!") in the absence of a more reliable referent. At any rate it was anticipated that, on the average in these groups, there would be less crystallization about HAbS, who would have more obstacles to overcome in order to play his role. Consequently, groups in which HAbS is not perceived at the outset were expected to be less effective than their counterparts in which HAbS was perceived prior to the group problem solving session.

This hypothesis, too, must be rejected. A statistical test in which the means of both groups were based on the differences between the pretest scores of HAbS and their group scores revealed no significant difference in effectiveness between groups in which HAbS was perceived and groups in which he was not. Although not statistically significant, the mean difference between HAbS and the group was larger under the non-perceived than under the perceived condition. The data of this test are shown in Table 2.3.

Insert Table 2.3 about here

Table 2.2

Test of the Significance of the Difference between the Means in Arithmetic Problems Solved of 40 High Ability Subjects and of the Groups of Which They Were Members

Experimental Conditions	Mean	t	p
Groups	16.85	2.00	N.S.
HAbSs	16.25		

PRECEDING PAGE MISSING

At the time that this experiment was designed, cognizance was taken of the fact that there might be no differences between the two group conditions on the criterion if the status of the originally non-perceived HAbSs changed during the group sessions. Hypothesis 3 was included as a means of checking on that eventuality.

Hypothesis 3

It seemed to be a possibility that as a result of group interaction in connection with work on the arithmetic problems that the special knowledge and skills of HAbSs would be recognized by his group mates. In that event, the groups should approximate in effectiveness those in which HAbS's merits had been recognized beforehand. To test the hypothesis of change over time in the status of an originally non-perceived HAbS, all members of every group were asked to answer the following question at the close of the group session:

> Name the one person in your group who helped the group the most to get the right answer. You may name yourself if you wish to do so.

For purposes of this analysis, only the nominations made by AvAbSs in groups in which HAbS was originally non-perceived are considered. The assumption is made that, since HAbS was not given a positive nomination pre-experimentally by either of his peers, that the mean score for HAbSs non-perceived before the experiment was 0. For post-experimental scores, the maximum possible was 2. The analysis was made of the amount of change from pre- to post-experimental nominations. On this basis, the hypothesis is supported, with the HAbSs receiving an average of 1.17 nominations of a possible 2 at the end of the experiment. These data are shown in Table 2.4.

Insert Table 2.4 about here

However, that is not the same as saying that originally non-perceived HAbSs are nominated as frequently as most helpful to the group as are the pre-experimentally recognized HAbSs. In fact, such a test (see Table 2.5) strongly suggests that such is not the case. While the post-experimental mean for non-perceived HAbSs is 1.17, that for perceived HAbSs is 1.75, a difference which is significant beyond the .05 level.

Insert Table 2.5 about here

It is somewhat surprising to discover that after the experiment, a significant difference remained in the nominations accorded the originally perceived and non-perceived HAbSs. There seem to be three classes of explanation, one of which might account fof the result.

Table 2.4

Test of the Hypothesis That the Status of an Originally Unrecognized HAbS Will Change Over Time

Time	Mean Number of Nominations	t	p
Pre-experimental	0		
Post-experimental	1.17	5.1	$< .01$

Table 2.5

Test of the Significance of the Difference between Mean Post-Experimental Nominations of Perceived and Non-Perceived HAbSs in Arithmetic Groups

Experimental Condition	Post-Experimental Mean	t	p
Perceived	1.75	2.15	$<.05$
Non-Perceived	1.17		

(1) The operation of "halo effect," either positive or negative, influencing the ratings given to HAbSs, with perceived subjects overrated or non-perceived subjects under rated with respect to their contribution to the group.

(2) Differential effectiveness of the group, with those in which HAbS-perceived tending to be more effective.

(3) Differential contributions to the group by HAbS-perceived and HAbS-non-perceived.

The first explanation is probably most accurate, although data do not show conclusively whether HAbSs-perceived are over rated or HAbSs-non-perceived are under rated. It seems likely that the latter is the case for the two reasons given below.

A test of hypothesis 2 revealed no difference in the effectiveness of the two kinds of groups which would suggest overall no difference between the two kinds of HAbSs in their contributions to the group. However, it seemed to be advisable to test that conclusion as directly as possible.

An analysis was made of the frequency with which the final solution to a problem was given by HAbS. Final solution to a problem was selected as an indication of the member's contribution to the group. For arithmetic groups in which the HAbSs were perceived, they accounted for 138 of the total 265 problems for which solutions were given, or 52%. Non-perceived HAbSs, on the other hand, contributed 129, or 51%, of the 253 final solutions in their groups. The difference between these percentages of solution is not significant.* (See Table 2.6). Thus the role played in the group by the non-perceived HAbS does not appear to vary perceptibly from that played by a perceived HAbS.

Insert Table 2.6 about here

The data of this study do not permit an adequate resolution of the questions concerning non-perceived HAbSs, but they do allow some interesting speculations. Certainly their status changes during the experimental session, but does not approach that of the earlier recognized HAbSs. Further attention will be given to this question in the final section of the chapter.

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*Significance of difference was tested by the formula, $\sigma_{D\%} = \sqrt{PQ[\frac{1}{N_1} + \frac{1}{N_2}]}$ where N_1 and N_2 are the number of cases in the two samples, P is an estimate of the common population parameter, and Q = 1-P.

Table 2.6

Test of the Significance of the Difference Between Percent of Final Solutions Contributed to Arithmetic Problem Solving Groups by Perceived HAbSs and Non-Perceived HAbSs

HAbS	No. of Solutions by HAbS	Total No. of Solutions	% of Solutions by HAbs
Perceived	138	265	52%
Non-Perceived	129	253	51%

Hypothesis 4

This hypothesis concerned the determinants of individual satisfactions with the operations of small groups. In operational terms, it was hypothesized that efficiency, or personal satisfaction of group members, would vary with the role played by individuals in the group. There are many kinds of role which might be identified. However, to test this hypothesis, role was defined simply in terms of the contribution to the group's problem solving, and roles were identified as 1, 2, and 3. 1 was always assigned to HAbS regardless of his contribution, 2 to the remaining member who made the most frequent contributions, and 3 to the least frequent contributor.

Before testing the efficiency hypothesis, it was felt necessary to demonstrate whether the three members of the group did make differential contributions. This was done by analyzing the percentage of final problem solutions advanced by each individual. Because it was felt that both socio-economic status and the status of HAbS might influence the proportions of subjects' contributions, separate analyses were made, and they are shown in Table 2.7.

Insert Table 2.7 about here

As can be seen from that table, HAbSs, whether pereeived or non-perceived, contribute more final solutions to the group, on the average, than do either of the other 2 members. But as a matter of additional interest, for all sets of groups except those from the lower SES neighborhoods in which HAbS is non-perceived, the 2 AvAbSs differ from each other consistently in their relative contributions to the group. Why this should be so is not clear at the present time, but provides a fascinating lead for a subsequent investigation, particularly when it is remembered that the AvAbSs for each group were selected to be as similar as possible to each other in ability, and therefore in potential contribution to the group.

Since it was demonstrated (with the exception of one comparison previously cited) that the 3 members contribute differentially to the group, data bearing upon their satisfaction with their particular group experience were analyzed to answer the question whether efficiency is related to role in the group. These analyses were also made according to the types of groups, and the results are incorporated into Table 2.8.

Immediately after the group effort was terminated, and before the pupils were dismissed by the experimenter, they were asked to complete a questionnaire which contained the following items:

Table 2.7

Test of the Significance of the Difference in Percent of Final Solutions Contributed by 3 Members of Arithmetic Problem Solving Groups**

Type of Group	Total Solutions	No. Contributed by 1*	2*	3*	% Contributed by 1	2	3
HSES - HAbS - Perceived	156	70	38	11	46.9	24.3	7
HSES - HAbS - Non-Perceived	157	76	55	15	48.4	35	9.5
LSES - HAbS - Perceived	109	68	30	8	60	27.5	7.3
LSES - HAbS - Non-Perceived	96	53	18	15	55.1	18.7	15.6

*1 - HAbS

*2 - AvAbS making more frequent contribution

*3 - AvAbs making less frequent contribution

**All comparisons of percentage significant beyond the .02 level except that between subject 2 and 3 for LSES groups in which HAbS is non-perceived.

1. I enjoyed working in this group today
   ___ (a) more than most groups I've worked in before
   ___ (b) about as much as most other groups
   ___ (c) less than most groups I've worked in

2. I like the other members of this group
   ___ (a) more than most other girls and boys I know
   ___ (b) about as much as most other girls and boys
   ___ (c) less than most other girls and boys

3. The problems we worked on in this group were
   ___ (a) more interesting than most school lessons
   ___ (b) about as interesting as most school lessons
   ___ (c) less interesting than most school lessons

4. If I had worked by myself on these problems
   ___ (a) I would have done better than the three of us did together
   ___ (b) I would have done about as well as the three of us did together
   ___ (c) I would not have done as well as the group did

Total efficiency scores could range from 0 to 8. For items 1, 2, and 3, a score of 2 was assigned to answer (a), a score of 1 to answer (b), and a 0 to answer (c). For item 4, the scoring key was reversed.

When the scores for all the arithmetic groups are examined, disregarding social class and status of HAbs, there is a slight tendency for number 2 subjects to report a higher efficiency than other group members. However, as seen from Table 2.8, this tendency is statistically significant only for groups in the higher socio-economic status area, in which HAbS is perceived.

Insert Table 2.8 about here

Hypothesis 5: An additional hypothesis of this study concerned the relationships between various needs of individual children, the social roles they played in the arithmetic problem solving groups, and the groups' effectiveness and efficiency. Conceptually the hypothesis stated that the effectiveness and efficiency of groups is related to congruence between personality needs of the members and the member's influence in the group. Operationally this becomes two hypotheses:

5a: When effective groups are compared with ineffective groups, more subjects who have played roles of influence in the group will have needs for achievement, needs for power, and needs for affiliation in the effective group.

5b: The efficiency of individual subjects who have needs for achievement, power and affiliation will be greater when these subjects have played influential roles in the group situation.

Table 2.8

Analysis of Variance Summary Tables of Tests of Significance of Difference in Efficiency Among the Three Members of Arithmetic Problem-Solving Groups

HSES - HAbS Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	13.78	6.89	5.22*
Within	15	19.83	1.32	
Total	17	33.61		

*Significant beyond .025 level with df = 2/15.

HSES - HAbS Non-Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	.12	.06	___*
Within	15	56.33	3.75	
Total	17	56.45		

*Not significant

LSES - HAbS - Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	7	1.5	.75	___*
Within	9	9.5	1.06	
Total	11	11		

*Not significant

Table 2.8 (continued)

LSES - HAbS - Non-Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	6.17	3.09	1.18*
Within	9	23.50	2.61	
Total	11	29.67		

*Not significant

An effective group was defined as one in which the group score was equal or superior to the earlier individual performance of the HAbS. Efficiency was defined, as indicated earlier, by each subject's self report of his satisfaction with the group experience. Needs for achievement, power, and affiliation were determined by scoring stories written by subjects in response to a series of TAT-type pictures. A subject was identified either as having achievement, power, or affiliation imagery or not manifesting such imagery. No effort was made to differentiate degrees of imagery.

The influence exerted by members of the group was defined as the relative number of final solutions to problems he offered. Since over all groups significantly different percentages of final solutions were given by the subjects earlier identified as #1, #2, and #3, this breakdown was used in testing the present hypothesis. High ability subjects were assigned the number one role, the subject in each group who made the next most frequent number of suggestions was identified as #2, and #3 was assigned to the least frequent contributor.

Nine analyses were made to test each of the hypotheses, 5a and 5b. In each analysis, the groups are identified as effective or ineffective. Then a comparison is made of the difference with respect to each of the needs between subjects playing each of the roles. For instance according to the hypothesis, more of the #1 subjects in the effective groups should exhibit need for achievement, power, and affiliation than in the ineffective group. Efficiency was treated as an individual variable and tests were made of differences in the congruent and non-congruent conditions. The results of these several analyses are contained in the tables below.

Insert Tables 2.8a and 2.8b about here

As indicated in the tables the hypotheses were not supported. Effectiveness and efficiency as defined by group success and by members' ratings did not co-vary with the congruencies of motive and role. We would suggest several lines of attack for future work on this problem. First, an extended conceptual analysis of effectiveness, efficiency, motive, role and congruency seems mandatory. This has been started in the present report. This conceptual analysis should culminate in more extended building of miniature theories (Zetterberg, 1954). Second, considerable attention to the measures and operationalization of each variable seems necessary.

Hypothesis 6

The final hypothesis to be considered in this section concerns whether the previously tested hypotheses apply alike to the groups drawn from the two socio-economic status areas. With respect to the difference between initial scores in HAbSs and group scores, these are quite similar to the overall test of the hypothesis. For the LSES groups, a mean difference of .65 favors the groups, as does a mean difference of .55 among the HSES groups. However, neither of these is statistically significant.

Table 2.8a

Relationships Between Personality Needs of Subjects Exerting Varying Degrees of Influence in Effective and Ineffective Arithmetic Groups.

Degree of Influence	Personality Need	Chi-Square	p
Most	achievement	2.21	>.10
Intermediate	achievement	.45	>.50
Least	achievement	.57	>.30
Most	power	.43	>.50
Intermediate	power	.05	>.90
Least	power	.06	>.90
Most	affiliation	.05	>.90
Intermediate	affiliation	.05	>.90
Least	affiliation	.33	>.50

Table 2.8$_b$

Relationships Between Personality Needs of Subjects Exerting Varying Degrees of Influence in Arithmetic Groups and Efficiency

Degree of Influence	Personality Need	Mean Efficiency Score of Subjects Manifesting Need	Mean Efficiency Score of Subjects Not Manifesting Need	t	p
Most	achievement	4.75	5.60	1.12	>.20
Intermediate	achievement	5.67	6.17	.77	>.40
Least	achievement	5.63	4.88	.95	>.30
Most	power	5.27	5.14	.16	>.80
Intermediate	power	5.80	6.25	.71	>.40
Least	power	4.00	5.54	1.56	>.10
Most	affiliation	5.30	5.00	.34	>.70
Intermediate	affiliation	5.63	6.30	1.08	>.20
Least	affiliation	5.38	5.13	.31	>.70

When separate tests are made for the two social classes of the difference in effectiveness between groups where HAbS is perceived at the outset, and groups where he is not, the statistical results are no differenct from the overall test. However, for HSES groups, a mean difference of 1.66 occurs favoring the groups in which HAbS is non-perceived. This difference approaches but does not reach statistical significance. For the LSES groups, the absolute difference between the two sets of groups is zero.

The status of originally non-perceived HAbS changes in groups in both socio-economic areas as a result of the group session. For non-perceived HAbSs in HSES groups, post-experimental nominations average .83 ($p < .05$) and in LSES groups, the mean nomination is 1.5 which the frequency of post-experimental nominations as greatest contributor to the goup given to non-perceived HAbSs is compared with that of the perceived HAbSs, reveals differences between the two socio-economic areas. For the HSES groups, perceived HAbSs attain mean nominations of 1.83 as compared with the .83 nominations given the non-perceived HAbSs. This mean difference is clearly statistically significant ($p < .02$). For the LSES groups, however the mean difference is negligible (.17 in favor of perceived HAbSs) and not statistically significant.

In general, then, except for the last mentioned result, there appear to be no differences between the two sets of arithmetic groups separated along socio-economic status lines, in the degree to which the hypotheses about group effectiveness are applicable.

SMALL GROUP PROBLEM SOLVING IN SOCIAL STUDIES: EXPERIMENT II

The hypotheses tested, and the procedures applied to these tests, were the same for the groups engaged in social studies problem solving as for the groups which had earlier been involved in the arithmetic task. Different groups of pupils were formed. As a matter of fact, no school which had participated in Experiment I was used in Experiment II. Again, 24 groups were constituted, 12 in higher and 12 in lower socio-economic status schools. Each groupwas composed of 3 members; one high ability subject (HAbS) and 2 of average ability (AvAbSs). Criteria for assignment to a group were the same as for the arithmetic groups. The only difference between the two experiments was in the task. Classes were pretested on Part One of the Sequential Test of Educational Progress (STEP) in Social STudies, Form 3A. The experimental task was Part One of Form 3B of the same task. This test consists of 35 items calling for knowledge and reasoning ability in elementary social studies.

RESULTS

Hypothesis 1

When the first hypothesis, that group superiority is related to the ability of HAbS, was tested with groups involved in solving social studies problems, the results are strikingly different from those of the test of the same hypothesis in Experiment I. The groups do significantly less well than HAbS does when he works independently. See Table 2.9.

Insert Table 2.9 about here

Hypothesis 2

The hypothesis that groups in which HAbS is perceived would function more effectively than those in which he was non-perceived was rejected on the basis of the arithmetic group scores. When the task is social studies the results are highly similar. There is a slight but non-significant difference favoring the groups in which HAbS is non-perceived. These results are included in Table 2.10.

Insert Table 2.10 about here

Hypothesis 3

The test of the hypothesis that the status of an originally non-perceived HAbS will improve over time was tested for social studies group members in the same manner as for arithmetic groups. The results of the first test are quite similar. There is a significant change in the number of niminations received by the HAbSs as having made the most important contributions to the group's success. Although statistially significant, this change is not as great as that for the non-perceived HAbSs in arithmetic groups. See Table 2.11.

Insert Table 2.11 about here

It appears highly likely that this finding is part of the general pattern for social studies groups. The groups do not perform as effectively as pre-test data on HAbSs suggests they could. Neither, however, are the more capable subjects perceived as making a contribution to the group as clearly as their counterparts in the arithmetic groups.

However, unlike the subjects in the arithmetic study, no statistically significant post-experimental difference remains between perceived and non-perceived HAbSs in the number of nominations they receive as most helpful to the group. See Table 2.12.

Insert Table 2.12 about here

Table 2.9

Test of the Significance of the difference between the Means in Social Studies Problems Solved of 24 High Ability Subjects and of the Groups of Which They Were Members

Experimental Condition	Mean	t	P
Groups	23.75		
HAbS	25.62	2.82	$< .01$

Table 2.10

Test of the Hypothesis That Social Studies Problem Solving Groups in which HAbS is perceived Are More Effective than Groups in which He is Not Perceived

Experimental Condition	Mean Difference (Group - HAbS)	t	P
Groups with HAbS Perceived	1.75		
Groups with HAbS Non-Perceived	2.08	.22	N.S.

Table 2.11

Test of the Hypothesis That the Status of an Originally Unrecognized HAbS will Change over Time

Time	Mean Number of Nominations	t	P
Pre-experimental	0		
Post-experimental	.92	3.68	$< .01$

Table 2.12

Test of the Significance of the Difference Between Mean Post-Experimental Nominations of Perceived and Non-Perceived HAbSs in Social Studies Groups

HAbS	Post-Experimental Mean	t	P
Perceived	1.42	1.44	N.S.
Non-Perceived	.92		

However, when the contributions of percent of final solutions offered by perceived and non-perceived HAbSs are compared, the results are the same as in the case of the same comparison for arithmetic groups. The perceived HAbSs contribute 47.1% of the final solutions in their groups; the non-perceived HAbSs 45.4%. This small difference in percentage is not statistically significant. (See Table 2.13)

Insert Table 2.13 about here

Hypothesis 4

The test of the efficiency hypothesis involved two kinds of analyses, as it had with the arithmetic groups. First the percent of contributions for all 3 group members was computed. HAbSs were always designated 1, the AvAbS in each group who made the greater contribution was 2, and 3 was assigned to the remaining AvAbS. The results of this analysis can be seen in Table 2.14.

Insert Table 2.14 about here

There is an interesting departure in the roles played by social studies group members as compared with arithmetic group members. For social studies groups in the lower socio-economic status schools, the HAbSs do not make a larger contribution to the group than the number 2 members, although both contribute more than the number 3 subject. This finding applies to the LSES groups where HAbS was perceived, as well as to the groups in which he was non-perceived, although in the former groups there is an absolute difference of about 5% in favor of the HAbSs.

When subjects' efficiency reports are analyzed, no differences in satisfaction are detected which relate to the role played by the subject in the group. This result is substantially the same as that for the arithmetic groups. In the next and last section of this chapter, additional analyses of the efficiency data and some post facto hypotheses will be presented.

Insert Table 2.15 about here

Table 2.13

Test of the Significance of the Difference between Percent of Final Solutions Contributed to Social Studies Problem Solving Groups by Perceived HAbSs and Non-Perceived HAbSs

HAbS	No. of Solutions by HAbS	Total No. of Solutions	% of Solutions by HAbS
Perceived	198	420	47.1%
Non-Perceived	157	346	45.4%

$$t = \frac{P_1 - P_2}{\sigma_{P_1 - P_2}} = \frac{1.7}{34.97} = .05 \text{ (N.S.)}$$

Table 2.14

Test of the Significance of the Difference in Percent of Final Solutions Contributed by 3 Members of Social Studies Problem Solving Groups**

Type of Group	Total Solutions	No. Contributed by 1*	2*	3*	% Contributed by 1	2	3
HSES - HAbS - Perceived	210	112	64	31	53.3	30.5	14.8
HSES - HAbS - Non-Perceived	140	76	44	18	54.3	31.4	12.9
LSES - HAbS - Perceived	210	86	74	44	40.9	35.2	20.9
LSES - HAbS - Non-Perceived	206	81	82	36	39.3	39.8	17.5

* 1 - HAbS

* 2 - AvAbS making more frequent contribution

* 3 - AvAbS making less frequent contribution

** All comparisons among pairs significant beyond .01 level except those between subject 1 and 2 for LSES - HAbS - Perceived and LSES - HAbS - Non-Perceived

Table 2.15

Analysis of Variance Summary Tables of Tests of Significance of Difference in Efficiency among the 3 Members of Social Studies Problem Solving Groups

HSES - HAbS Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	.76	.38	____*
Within	15	8.34	.56	
Total	17	9.10		

*Not significant

HSES - HAbS - Non-Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	.67	.33	____*
Within	9	13.00	1.44	
Total	11	13.67		

*Not significant

LSES - HAbS - Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	9.34	4.67	2.14*
Within	15	32.66	2.18	
Total	17	42.00		

*Not significant

Table 2.15 (continued)

LSES - HAbS - Non-Perceived

Source of Variation	df	Sum of Squares	Mean Square	F
Role	2	.33	.17	___*
Within	15	40.67	2.71	
Total	17	41.00		

*Not significant

Hypothesis 5

Hypothesis five replicates, for the social studies problems, our predictions concerning the congruency of individual motives and social roles played by group members and the relationship of the congruency to the effectiveness and efficiency of the groups. The analyses were made in the same fashion as in the arithmetic tasks, that the congruency hypotheses are not supported. The data are presented in Tables 2.16 and 2.17

Insert Tables 2.16 and 2.17 about here

Hypothesis 6

For the hypothesis that socio-economic status is related to the effectiveness of small group problem solving in social studies, the difference between initial score of HAbS and his group's score was compared separately for each socio-economic status. The overall test had revealed a statistically significant difference with the HAbSs achieving higher scores in isolation that the later scores of their group on a comparable task. When this hypothesis is analyzed separately by SES the statistical significance remains applicable only to the HSES groups. The mean difference of 2.25 favoring HAbS is significant beyond the .01 level. Although a mean difference of 1.50 in the same direction occurs for the LSES groups, the difference is not significant. This last finding is most interesting in view of the fact that in these groups, HAbSs do not contribute appreciably more to the group decisions than do the number 2 subjects, although on the pre-tests at least, their scores are higher than those of either AvAbS.

The socio-economic status analyses of the differential effectiveness of groups in which HAbS is or is not perceived gives results quite similar to the overall test of that hypothesis. In both cases there is a small mean difference (.17 in HSES groups and .34 in LSES groups) favoring the groups in which HAbS is non-perceived. Neither of these differences approaches significance.

Different results for the two-socio-economic area groups occur when a test is made of the change in status of the originally non-perceived HAbS at the end of the experimental status. A significant change occurs for the HSES groups ($M_d = 1.33$; $p < .01$) but not among non-perceived HAbSs in the LSES groups ($M_d = .50$). When the post-experimental nominations accorded perceived HAbSs and non-perceived HAbSs are analyzed by socio-economic status, the results are the same for both SES groups; no significant difference in nominations for best contribution between the perceived and non-perceived HAbS.

Table 2.16

Relationships Between Personality Needs of Subjects Exerting Varying Degrees of Influence in Effective and Ineffective Social Studies Groups

Degree of Influence	Personality Need	Chi-Square	p
Most	achievement	.01	>.90
Intermediate	achievement	.21	>.50
Least	achievement	.07	>.70
Most	power	.08	>.70
Intermediate	power	.44	>.50
Least	power	.19	>.50
Most	affiliation	.42	>.50
Intermediate	affiliation	1.02	>.30
Least	affiliation	1.14	>.20

Table 2.17

Relationships Between Personality Needs of Subjects Exerting Varying Degrees of Influence in Social Studies Groups and Efficiency

Degree of Influence	Personality Need	Mean Efficiency Score of Subjects Manifesting Need	Mean Efficiency Score of Subjects Not Manifesting Need	t	p
Most	achievement	5.64	5.33	.50	>.60
Intermediate	achievement	5.60	5.80	.35	>.70
Least	achievement	6.22	5.90	.58	>.50
Most	power	5.57	5.46	.19	>.80
Intermediate	power	5.86	5.62	.46	>.60
Least	power	5.71	6.25	.96	>.30
Most	affiliation	5.17	6.00	1.54	>.10
Intermediate	affiliation	5.70	5.70	—	—
Least	affiliation	6.00	6.12	.21	>.80

Among the social studies problem solving groups, the tests of the hypotheses for the HSES groups are similar to the results with the arithmetic groups. Variation in group task from arithmetic to social studies problems appears to have exerted a differential effect on the LSES groups. In general, this effect concerns the HAbS, and apparently independently of whether he is perceived or non-perceived. The overall impression given is that the HAbS is much less important to social studies group members in the lower socio-economic areas than to members of other groups. Here HAbS plays a role which is not reliably different from the second member of his group, as far as total group contribution is concerned. After the experimental session HAbSs do not receive as many nominations as their counterparts in arithmetic groups. Originally non-perceived HAbSs do not change significantly in status, but their status at the close of the experiment is not significantly different from that of earlier recognized HAbSs. Non-perceived HAbSs do not rise in status to meet the other; perceived HAbSs, rather, appear to decline from their earlier held position.

DISSCUSSION AND CONCLUSIONS OF THE SMALL GROUPS EXPERIMENTS

The chief question posed about the experiments by this final section is, "What are the influences of a change in task on small group effectiveness and efficiency?" The answer is not as simple as it might be, since there is apparently an interaction between task and socio-economic status of the problem solving groups.

For the first question of the study, "What is the realtionship between HAbS and the effectiveness of the group?" four answers were developed. Three of the answers are consistent with each other, and with the hypothesis that no significant difference would occur between the productivity of HAbS by himself and that of a group of which he was a member. The fourth analysis, however, (LSES groups solving social studies problems) reflected a significant difference between the two scores, with the groups doing less well than HAbS had done by himself.

The task seems to make little difference when the effectiveness of groups in which HAbS is perceived is compared with that of groups in which he is non-perceived. There are no significant differences, although for both tasks groups in which HAbS is non-perceived score slightly higher.

What happens to the status of HAbS during the experiment appears to be related both to the group's task and to SES. Again with one exception (LSES groups solving social studies problems) the status of originally unrecognized high ability subjects does improve as predicted. In three of the four cases, including the LSES social studies groups, no difference in status remains after the experimental session between perceived and non-perceived HAbSs. However, no single interpretation seems suitable for all the findings. In the case of HSES arithmetic groups, while there is a significant improvement in the status of non-perceived HAbSs, it does not raise their status to the equivalent of perceived HAbSs. The results for LSES arithmetic groups and HSES social studies groups are similar to each other and the same interpretation is applicable. The improvement in status of non-perceived HAbSs is sufficient that after the experiment it is not different from that of HAbS perceived. As previously observed, no post-experimental difference in status remains between perceived and non-perceived HAbSs in LSES social studies groups, but this is caused by the loss of the former rather than by the gain of the latter.

The analysis of the task variable seems to be one of the most important steps in future research. The reader will recall the following results: first, the arithmetic groups approached significance in producing more effectively than the individual high ability members working alone; second, the social studies groups did significantly poorer than the individual high ability member working alone. Conceptually we would argue that the task variable, social studies problems vs. arithmetic problems needs analysis in terms of more genotypic constructs. For instance, can the difference be attributed to the m ee explicitly taught responses and response sequences in arithmetic in contrast to social studies? Are the reading demands of the social studies problems, another set of specific skills, the critical difference? Can the differences be analysed along dimensions such as semantic, figural, symbolic or behavioral as some current work would suggest? Is there a group dimension, ease of obtaining social social consensus for instance, which accounts for the differences? Does the problem lie more in the degree of veridicality obtainable in each individual's perception of his skills in relation to the skills of his peers? All of this suggests, as do our conclusions in chapters three and four that increased sophistication in theory is mandatory in educational research.

The socio-economic replication seems worthy of a comment in as much as there is considerable discussion today of the problems in teaching and learning in culturally deprived areas. The major conclusion we would draw is the similarity of small group functioning between the two socio-economic levels. A few differences do exist however. In the arithmetic task all but one of the comparisons is comparable; the difference lies in the high ability non-perceived subjects who increase in relative status in the MSES groups but not in the LSES groups. In the social studies task the same phenomenon occurs. From our data, as we have indicated, no extensive interpretations are possible. In terms of problems of teaching our data suggest that small groups of children from either socio-economic level may facilitate the high ability members' work in arithmetic and seem to hinder his work in social studies. In the lower SES sample the high ability member does not contribute more frequently to the final solutions in social studies and the group does not mis-perceive his contributions. Our data on motives and social roles do not explain this. Whether an attitudinal variable toward some school work would account for this is not known. As we have indicated this phenomenon interacts with the task variable — the arithmetic results follow the direction of the middle socio-economic sample. Such findings suggest important leads for new theory and research.

CHAPTER THREE

The Correlates of Classroom Functioning

INTRODUCTION

It is with some trepidation that one moves into a discussion of a problem which sounds as simple as, "The correlates of classroom functioning." Cloaked within this phrase are a series of assumptions such as (1) the problem is an important one in the eyes of elementary and secondary teachers, (2) the behavioral sciences - especially psychology and sociology - have important concepts and measuring tools which will give purchase on the problem, and (3) educational and instructional theory is advanced to the point where conceptual contact can be made among such broad disciplines and problem areas. It might be well to look at two recent general statements in the field for evidence concerning portions of these assumptions.

In the foreword to THE HUMAN GROUP (Homans, 1950), Bernard deVoto raises the essence of one aspect of the problem.

> Early in his book, Mr. Homans asks a question of his fellow sociologists: 'What single general proposition about human behavior have we established? . . . Has it made one theoretical formulation that is uniformly descriptive?'
>
> Considering that sociology is the study of men living in society the question is a startling one, and so is Mr. Homans' admission that it must be answered 'no' (p ix).

While one often finds such statements as these in the introductions of books one also usually finds the author proceeding to demonstrate that he has now done or begun to do what no one has been able to do before. So it is with Homans' analysis of five case studies of groups and communities, in a factory, in a boys' gang, in a primitive society, in a business organization at the management level, and in a small town. From this analysis he developed a series of concepts and he integrated them into relationships or principles. The concepts of activity, sentiment, interaction, norm, internal system, external system, environment, and so forth are the basic ones he uses to analyze the behavior of human groups.

We mention them briefly here to indicate that behavioral scientists in the area of more general theory have the beginnings of a framework which might prove helpful to the educator in attempting to formulate one of his problems in a more general and, hopefully, more powerful manner. We will clarify this position shortly.

A second, but clinical, general position is relevant to this introductory discussion. A number of behavioral scientists, of whom Lippitt and his colleagues are representative, have focused more on the use of scientific knowledge for solving critical problems in human relations. The book, THE DYNAMICS OF PLANNED CHANGE, (Lippitt, et al,

1958) is illustrative of their efforts. This analysis suggests that it is possible to conceive of change agents, individuals who are entering a relationship to bring about change in mutually profitable directions, and client systems, individuals, groups, organizations and communities which are to be changed. In a chapter entitled "Diagnostic orientations toward problems of internal relationships" the authors raise three dimensions of client systems which need examination; these are internal distribution of power, internal mobilization of energy, and internal communication. The assumption which seems to be made is that these dimensions are necessary and sufficient for understanding the functioning of systems which might be changed or which require changing. Implied within this discussion is a concept of "level of functioning" which can be used as a criterion for judging the individual personality, small group, or larger organization. It behooves the educational behavioral scientist to comment as to whether educational groups can be considered to have such level of functioning criteria and if the three internal dimensions are comprehensive enough to account for the problems of internal relationships. As a partial answer to such a question one might ask whether concepts or principles which come from a system such as that presented by Homans lie outside of the Lippitt dimensions. At first glance, and as an illustration, one might raise the question of the impact of group norms on group functioning. Does this have its counterpart in the Lippitt scheme?

Essentially our analysis will proceed in this fashion. We will suggest the outlines of a gradually evolving conception of the classroom as a social system. As the concepts and propositions which make up this point of view are articulated then we can attend to the specific problems and hypotheses which make up the present investigation. These hypotheses actually will not neatly test the theory for the theory has been in evolution since the present design was crystallized and the data were gathered. The data will, however, clarify aspects of the theory and show next steps which must be taken and also which hypotheses seem ready for translation into clinical practice in understanding classroom groups which are not functioning as well as they might.

THEORETICAL BACKGROUND

An applied science such as education requires that one relate one's variables to outcomes which have been stressed by the community as desirable (Derr, 1958). While it is legitimate within science to investigate the interrelationships of a variety of variables, most applied areas, for example, medicine, engineering, and education, ultimately demand that the interrelationships be linked to the purposes for which the institution was established. At this point it is not necessary to enter a discussion of educational objectives as these have been raised in considerable detail elsewhere. (Bloom et al 1956, Kearny, 1953). However, we should be clear on several of our assumptions:

1) Individual learning is, in our judgment, the most important outcome of the school.

2) Learning is not unidimensional; it subsumes cognitive learning, affective learning, and psychomotor learning.

3) Each of these outcomes contains sub-dimensions e.g., cognitive learning includes creative thinking and critical thinking.

4) The determinants of these component learnings are not necessarily common to all areas, e.g. some activities useful in increasing knowledge of facts may not be the same activities which most facilitate creative thinking.

In the present investigation we did not study the correlates of individual learning. We studied the correlates of a dual criterion--group effectiveness and efficiency--which is intermediary in a relationship between group variables and individual learning. Hence, another of the assumptions we are making is that increased effectiveness and efficiency will increase individual learning. The tenuousness of this assumption is recognized and seen in the preceding paragraphs in our statement about the dimensions of learning. This tenuousness is seen also in our analysis of the concepts effectiveness and efficiency in the next section. Figure 2.1 presents graphically this aspect of the theory.

Insert Figure 2.1 about here

THE CRITERIA

Group Effectiveness

A frequent judgment made of a group concerns the degree to which a group is reaching its goals. The concept of group effectiveness refers to this judgment (Barnard 1938, Homans and Riecken 1954). At a conceptual level one speaks of social system effectiveness. In an educational setting, the statement "the degree to which a group reaches its goals" contains several kinds of complexity. First, it illustrates one of our basic postulates that a group must survive in its environment. In a very real sense a group is a function of the environment.

Second, the group is related to other groups, and the latter constitutes a portion of the environment. The other groups become possible sources for judgments as to whether the group is reaching its goals. These potential sources include 1) the broader community, 2) the parents of the children, 3) the school board, 4) the school administration, 5) the faculty of the school, 6) the pupils in the school, 7) the teacher of the classroom, 8) the pupils in the class. It is entirely possible that the goals specified by one group are not congruent with the goals specified by an alternative group.

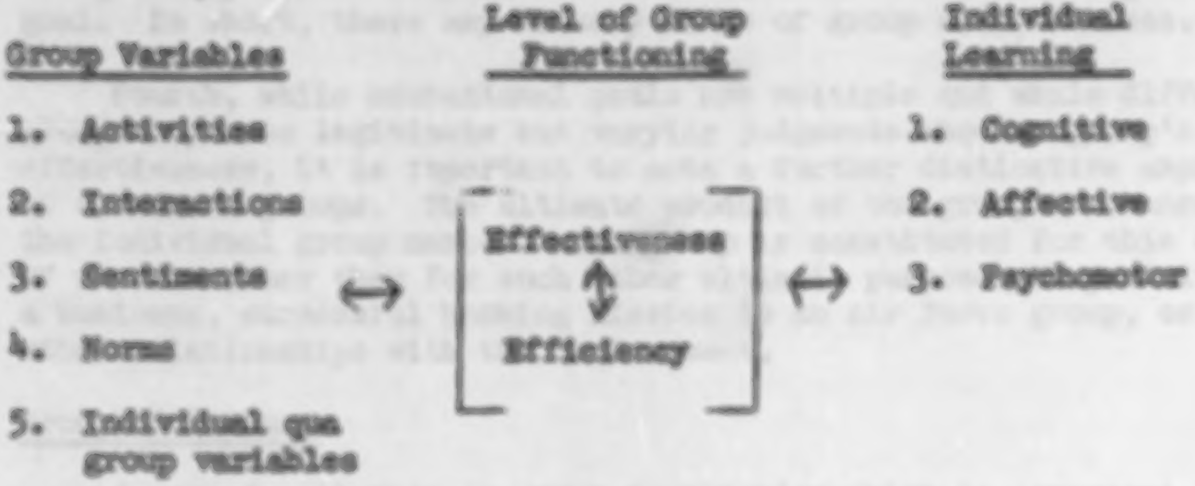
Group Variables
1. Activities
2. Interactions
3. Sentiments
4. Norms
5. Individual qua group variables
Level of Group Functioning
Effectiveness
Efficiency
Individual Learning
1. Cognitive
2. Affective
3. Psychomotor

Fig. 2.1 A preliminary model of the observed and assumed relationships in the classroom study.

Third, the goals may vary between high degrees of similarity and the possibility of mutual attainment to mutual exclusiveness. Within an educational classroom group goals usually encompass such diverse ends as creativity, critical thinking, and knowledge of specific information. The conditions which provide for reaching one goal may not be comparable to the conditions for reaching another goal. In short, there may be many kinds of group effectiveness.

Fourth, while educational goals are multiple and while different groups may make legitimate but varying judgments about a group's effectiveness, it is important to note a further distinctive aspect of classroom groups. The ultimate product of the group is change in the individual group member. The group is constituted for this kind of result rather than for such other ultimate purposes as profit in a business, successful bombing mission in an air force group, or other relationships with the environment.

Group Efficiency

A second criterion of group functioning which is important in educational groups is group efficiency (Barnard 1938, Homans and Riecken 1954). Group efficiency refers to the satisfactions which accrue to the members of the group. In many groups, effectiveness and efficiency will overlap completely. As the group reaches the goal, and as the group members share common goals, the satisfactions will be high. This simple relationship has at a minimum at least several complexities. First the goals for which the group was constituted soon are elaborated and encompass other aspects of the members' motives. Second, educational groups are constituted by others than the participants. In effect this means that the members are involved in "non voluntary groups." This results, at least to a degree, in having members who, at first blush--if not later--do not perceive the group as a source of satisfaction. In this kind of a group, the concept of group efficiency can be perceived as an important criterion. In so far as the group produces satisfactions of some kind, the individual will strive for outcomes or goals which initially may be alien to him.

Third, satisfactions are varied and idiosyncratic. Within a group sources of satisfaction are multiple. Satisfactions from the goals of the group, the tasks performed to reach the goals, and the individuals with whom one interacts may be at least partially independent.

Non voluntary groups - a footnote

Initially, there seems to be a paradox in such statements as groups arise to mediate satisfactions and some groups have members who don't perceive the group as a source of satisfaction. To resolve such an apparent contradiction a concept such as comparison level for alternatives is required (Thibaut & Kelley, 1959). Maximum satisfaction or goodness of outcomes is a function of satisfactions or rewards gained and punishments or costs avoided. If the alternatives available to an individual are essentially negative or punishing, the group may be said to be non-voluntary. As we have indicated, it is non-voluntary only in the sense that one is not pursuing positive goals but is avoiding punishing outcomes. Considerable evidence suggests that this condition becomes exceedingly important in the functioning of a group.

The first aspect of this impact is that overt aggression and hostility frequently occur. The member says, "I really don't want any part of this group." Second, one frequently obtains passive but apathetic overt conformity and lack of activity relevant to the task. Third, one often obtains frightened or anxious behavior rather than constructive problem solving behavior.* The behavior of the group member is most similar to the individual in a double avoidant conflict. He doesn't want to be here but being elsewhere is worse. In short, the efficiency criterion seems especially relevant to non-voluntary groups.

Efficiency and Effectiveness in Educational Groups

When the teacher judges the effectiveness of her class, we assume that the factors underlying the judgment are, 1) the professional view of objectives which she has incorporated, 2) her own unique view of classroom purposes, 3) the particular characteristics of the classroom with which she is working, and 4) the relevant experiences she has had with other classroom groups. The efficiency judgment can reflect 1) the satisfaction she perceives accruing to herself, or 2) the satisfactions she perceives accruing to the pupils. Each of these alternatives will be conditioned by the groups she has typically experienced and the experiences of her colleagues in educational reference groups such as the school building and faculty of which she is a member.

Operationally, in the present study each dimension was converted into a rating scale, Figures 3.2 and 3.3. The scale accented progress toward institutional goals (pupil learning) and satisfactions accruing to the teacher. These selections among the alternative conceptions of effectiveness and efficiency most certainly have important implications in the findings. Because of the difficulty in central tendency, halo, and other effects in rating scales, each teacher rated two classroom groups with whom she worked. Groups selected for the study were those in which the teachers perceived differences in both effectiveness and efficiency.

Insert Figures 3.2 & 3.3 about here

Effectiveness and efficiency as defined in this investigation should be highly related. In non-voluntary groups, groups which are entered to avoid other costs and punishments, the teacher faces the problem

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*See especially Guetzkow's et al., (1953) discussion of self-oriented needs and Rosenthal & Cofer's (1948) laboratory investigation of individual attitudes and group performance.

GROUP ACCOMPLISHMENT RATING

1. On the scale below check the point which best describes the accomplishments or productivity of the class you are rating.

   ________ Very High: This group has accomplished more than almost any other class I've ever taught.

   ________ Above Average: In terms of accomplishment, this group is one of the better classes I've had.

   ________ Average: This group is typical of most classes; the pupils work reasonably well on school tasks.

   ________ Below Average: The pupils accomplishments, such as they are, are the result of consistent prodding on the part of the teacher.

   ________ Very Low: Seldom, if ever, have I worked with a group which has accomplished so little, in spite of everything I've tried.

2. Please indicate any additional pertinent comments you have about this group.

Figure 3.2 Rating scale for group effectiveness.

GROUP SATISFACTION RATING

1. On the scale below, check the point which best describes your personal satisfaction with the class you are rating.

________ Very High: I wish that every year I could have a class of children who are as enjoyable to work with as this group. This group has been one of the most satisfying to work with.

________ Above Average: This group is one of the more enjoyable groups I've worked with.

________ Average: This group is typical of most classes; the students and I get along reasonably well with each other.

________ Below Average: While this is not a particularly difficult group, it is the kind of group with which I would rather not work.

________ Very Low: This is a most dissatisfying and difficult group with which to work; it is the kind that has the reputation for giving every teacher trouble year after year.

2. Please indicate any additional pertinent comments you have about this group.

Figure 3.3 Rating scale for group efficiency.

of evoking more than minimal participation on the part of group members. If pupils are responsive the teacher will be very satisfied. If they are responsive, minimal attention by the teacher to the content to be taught, the evoking and reinforcement of correct responses, extinction of incorrect responses, will produce, in the teacher's perception, high task accomplishment. Consequently, it was predicted that there will be a high relationship between the efficiency and effectiveness of educational groups.

This prediction was tested in the present study. Such a relationship was found, C = .67. (The maximum value of C in a 3 x 3 table is .82) Chi square is 88.51, p .01. These data are in Table 3.1.

Insert Table 3.1 about here

THE DIMENSIONS OF A CLASSROOM GROUP

As the content of Figure 2.1 implies, the theoretical analysis of the group into dimensions is a necessary prerequisite for establishing correlates of group functioning. In recent years a number of approaches have been suggested in educational and behavioral science literature. Hemphill (1956) presents a taxonomy of group dimensions and an instrument for measuring the dimensions. His theory includes such concepts as autonomy, the degree to which the group functions independently of other groups, control, the degree to which the group regulates the behavior of members, flexibility, the degree to which the group is characterized by informal procedures, intimacy, the degree to which group members are mutually acquainted and familiar with one another's background, and so forth. The relationships of this conception to broader conceptions of social and behavioral theory have not been suggested. There are brief data on the relationships between the dimensions and criteria of morals and productivity; these relationships are minimal in number and degree. To the knowledge of the present investigators, his instrument has not been adapted for investigating classroom groups.

Another taxonomy has been suggested by Francis Cornell and his associates (Cornell et al, 1953). In their investigation of community influence upon public school education they faced the issue of describing the totalities of classrooms. After agreeing on criteria such as comprehensiveness, historical importance, significance, and objectivity they organized a series of eight dimensions: differentiation, social organization, content, pupil initiative, variety, competence, climate teacher, and climate-pupil. This taxonomy was similar to Hemphill's in that 1) it was not functionally related to a broader social or behavioral theory and 2) it has been instrumented as a measuring device. It is an observational schedule, however, in contrast to Hemphill's instrument which is a questionnaire. Cornell presents data on community relationships to classroom structure and data

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on the interrelationships of the dimensions; he does not relate his dimensions to group outcomes or to individual learning.

Although such approaches as the above were available, the theory underlying the conception of the present investigation was based most heavily upon two significant strands of thinking. First, the broader social theory of Homans as it had been presented generally in The Human Group and more specifically in the paper with Riecken, "Psychological aspects of social structure" in the Handbook of social psychology (Lindzey, 1954). The second strand of thinking lying behind this investigation was our more intuitive observations of classroom processes and earlier collating of research and literature (Smith, 1958, Smith 1959). This resulted in a conceptualization involving 1) individual qua group variables; 2) the teacher: interaction, sentiment, and norm; 3) sentiment structure; and 4) social motives and pupil interaction.

INDIVIDUAL QUA GROUP VARIABLES

In conceptualizing a social system, one of the component parts with which one must deal is the individual system. Typically this requires several levels of discussion. First, one must specify the personality variables, in structural terms. Second, one must look to the performances of the individual in the group, his behavior in action. It is possible to look also at the discrepancies in his behavior and in the personality variables measured independently. We take up each of these in turn.

Mental Health

Mental health has a long and troubled history in psychology. One of the most recent attempts to bring conceptual order into the discussion is the monograph, Current Concepts of Positive Mental Health by Marie Jahoda (1958). She makes several points which we see as critical for the present discussion. First she speaks of a distinction between relatively permanent and relatively transitory phenonema. In terms of a medical analogy, a person with cold may be viewed as "basically healthy" even though he has a momentary illness; or he may be seen as ill because he does have the cold. Our use of the term mental health refers to the former construct, a more basic disability. Bower's (1959, 1960) use of the term "emotional handicap," an inability or set of limitations, catches the flavor of this same distinction. Jahoda makes a second distinction, mental health is essentially an evaluative construct. This is analogous to M. B. Smith's (1959) phrasing, "personality evaluated." The major implications are two-fold. The concept requires a position on a theory of personality and a value judgment regarding the "goodness" or "badness" of one position on these dimensions.

While Jahoda does not present any working final integration of these concepts she does suggest that scholars in the field tend to use one or more combinations of a half dozen broad conceptual frameworks. These are:

1. Attitude toward self
2. Growth, development and self-actualization
3. Integration
4. Need for perception
5. Autonomy
6. Active mastery of the environment

Conceptually our position draws most heavily upon the sixth criterion. Each of these, active mastery of the environment, for instance, is unfortunately not unidimensional. For an adult, it can mean a number of specific things; Jahoda cites Ginsberg's resolution in terms of adequacy in love, work, and play. In effect, can the individual maintain a family, hold a job, and enjoy available recreational possibilities. In the instance of public school children, we are conceiving of these individuals as ones who maintain positive affective relationships with their peers, enjoy and are able to carry out the work tasks of the school, and are not in continuous conflict with authority. Operationally, the measure we used was empirically validated and cross validated against a pupil nomination criterion and a teacher nomination criterion (Smith, 1958, 1959).

It is our belief that there is a second order factor which engages elements of each of these criteria. Although there is no definitive work indicating this, the kind of evidence to which we would appeal is the well known data of Stock (1949) and Scherer (1949). Essentially, they found that individual statements in counseling interviews showed a covariation between self-acceptance and acceptance of others. As the interviews progressed both self concepts and social concepts changed. While the study is typically interpreted causally, a change in self concepts results in a change in social concepts, the data actually reflect covariations.

With this brief introduction to the concept of mental health, one can then see the chain of reasoning connecting it to classroom effectiveness and efficiency. The hypothesis states as the number and degree of mentally healthy individuals increases, the classes will be judged more effective and efficient. Mentally unhealthy individuals will show more hostility, less skill in cooperative group relationships, less interest in adult (and school) goals and less response to requests to move toward these goals, and more conflict and anxieties with problems of self and social relationships and hence less energy to turn to the tasks of the school. Each of these, as well as the composite, describe behaviors which makes task groups much more difficult to lead as well as to function effectively and efficiently. In terms of our operational definition of effectiveness and efficiency, the teacher should perceive such a group of individuals as being unproductive and of low morale.

Intelligence

While the concept of intelligence has been a mainstay of the differential psychologist interested in stable personality attributes and of the educational administrator who deals with the problems of selection of students and of prediction of success, the functional psychologist has found the concept troublesome. It does not qualify as a learned trait nor as a motive nor as a particular perceptual organization. Into most of the functional psychologist's equations it would fit as a constant or as a concept reducible to more basic terms. It is this latter orientation we will take. Our reasoning is illustrated in the following propositions.

1. The school as an institution demands progress toward academic goals.
2. Teachers generally accept these institutional goals and attempt to work toward them.
3. Pupils with high intelligence attain academic goals with less frustration than pupils with low intelligence.
4. Increased pupil frustration leads to group ineffectiveness and inefficiency.

One of our major hypotheses then is: Intelligence will be positively related to group effectiveness and efficiency.

A second hypothesis also derives from the intelligence concept. The assumptions and propositions are these:

1. Classes differ in their variability in intelligence.
2. As variability increases it is more difficult to move them to academic goals.
3. Difficulty in locomotion requires more cost producing activities on the part of the teacher.
4. Cost producing activities lower the effectiveness and efficiency of the class.

The hypothesis then is: Classroom effectiveness and efficiency is negatively related to the variability in intelligence of the classroom group.

Motive

One additional individual personality variable, motive, often treated as a group variable, was investigated in this study. Motive is defined by theorists in many ways; our conception draws upon Atkinson's (1958) position that a motive is a disposition to strive for a particular kind of goal, state, or satisfaction. In this investigation we utilized three widely discussed and theoretically meaningful motives, achievement, affiliation, and power. The following definitions and propositions constitute the reasoning involved in our predictions of achievement motivation.

1. Achievement motivation refers to satisfactions obtained in pride of accomplishment or competition with a standard of excellence.
2. Society structures the classroom toward achievement goals.
3. The classroom is a social situation with limited rewards which implicity, if not explicitly, fosters competitiveness.
4. Effectiveness demands task related behavior of the group members.
5. The hypothesis is that classrooms with members who have achievement motivation will be more effective.

In regard to affiliation motivation the following statements are relevant:

1. Affiliation motivation refers to satisfactions obtained in developing or maintaining a positive affective relationship with another person.
2. The elementary school classroom by its very organization demands close interpersonal contact.
3. Interpersonal contact or interaction which is not desired leads to inefficiency and ineffectiveness.

The hypothesis: Classrooms with members who possess affiliation motivation will be more efficient and effective.

Regarding power motivation the following definitions and propositions are pertinent:

1. Power motivation refers to satisfactions gained in being in control of the means of influencing the behavior of other persons.
2. Classroom groups localize power in the teacher rather than in pupils.
3. Pupils who desire control of influence will be in conflict with the teacher.
4. Teacher-pupil conflict will lead to ineffectiveness and inefficiency.

5. Pupil frustration (blocked gratification) will lead to ineffectiveness and inefficiency.

The hypothesis: Classes containing pupils with power motivation will be more ineffective and inefficient.

The Teacher: Interaction, Sentiment and Norm

Our theoretical position contains two higher order or secondary concepts, role and position, which are useful in conceptualizing the classroom as a social system. Members of a group frequently expect that one individual in the group should have special sentiments and should carry out special activities and interactions. Insofar as these expectations tend to be shared, they are a part of the normative structure of the group. In educational groups, the teacher is set apart from the members of the group in that she is expected to do something that pupils are not expected to do. She has a different position and a different role. Let us trace out the theoretical implications of this.

As an individual, Teacher A is expected to fulfill a role different from the pupil members of the group. In this context then we mean that her behavior is governed by a particular set of norms. More generally it is possible to conceptualize her role as a sub-part of a larger group or organization. In this context it is possible to view the organization as a set of roles--or positions--each of which is integral to the functioning of the organization in its environment. Organizations differ from groups only quantitatively in the degree to which their structure has been codified, rationalized, and impersonalized. When viewed this way it is often necessary and useful to speak of positions in a group or organization. These positions are usually defined in terms of their relationships to the broader goals of the organization and functions to be performed in order to reach the goal. Any one position then receives some of its meaning in relationship to other positions. Often implicit in the relationships is a statement of value or importance.

To return, our analysis suggests that pupils may have a set of expectations about the broader organizational position of the teacher. They soon develop perceptions concerning the incumbent of the position.

The larger structure is a part of the social environment of the classroom group. Several important implications which are especially relevant to the teacher arise in regard to their relationship. One of these concerns the power of the teacher. Power refers to the fact that one individual can control the outcomes (rewards and costs) of another individual. The bases of power have been analyzed into a number of kinds (French and Raven 1959). One may speak of legitimate power, reward power, coercive power, referent power, and expert power. Because of the relationship of the classroom group to the school organization and of the school organization to the broader community, the teacher has resources in each of these kinds of power. The pupils perceive the teacher as having the right to influence them and they (the pupils) are obligated to respond.* The teacher has at her command a host of direct and indirect rewards and punishments which she can utilize when needed. By the fact of her training she is an expert in the specific tasks which the group faces. She knows more mathematics, history and sciance than the pupils do. Referent power is the control of outcomes related to interpersonal attraction between the teacher and the pupil. Implicit in her relationship with pupils is this basis also.

With this brief account of the social environment and the power of the teacher we may turn back to the role of the teacher in the group. It is probably most fruitful to conceptualize the "roles" of the teacher; this has not been done to any great degree but initially one might see several possibilities, 1) instructional role, 2) leader role, 3) school community role, and 4) staff role. Each of these may be analyzed in various ways. For instance, B. O. Smith, in discussing "The Pedagogical Class as a Social System," makes reference to substantive, logical and psychological aspects of the instructional role. Other educators and psychologists make alternative analyses. It is to the conception of the role centering about the teacher as a leader that we would turn.

The specific functional relationships between the teacher's behavior and classroom effectiveness and efficiency can now be drawn in the form of a series of related definitions and propositions.

1. The teacher is expected to be the leader of the group, that is, there are group norms relevant to this role.
2. The role of institutional leadership contains two subroles: Initiating Structure and Consideration.
3. Teacher behavior which deviates from one or both of these roles can be viewed as a departure from group norms.
4. Such departures produce dissonance and stress within group members.
5. Reduction of such dissonance and stress usually takes several channels such as by a) devaluation of the leader (the teacher in this case), b) disassociation of the behavior from the leader--e.g., "he really didn't mean it," and c) ascription of the behavior to factors outside the leaders control--e.g., "he had to do it."
6. The loss of idiosyncracy credits by the teacher is comparable to a loss in power.
7. A loss in power means that future orders are less likely to be carried out.

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*The situations where this is not true are quite important in their own right.

8. Disruption in this sequence implies less effectiveness in the group's goal attainment (loss of external rewards) and more dissension within the group (loss of internal rewards). Such a group is defined as ineffective and inefficient.

In summary, one might express the working hypothesis in this fashion: the departure of the teacher's behavior from the norm will produce group ineffectiveness and inefficiency.

Attributed Power and Teacher Role

An attempt was made to extend the reasoning underlying the teacher hypothesis; this resulted in a second hypothesis which--in substance--is a more rigorous test of the first.

1. Individuals (children in the class) who are high in attributed power are more influential than the average class member in the activities and interactions in the classroom.

2. As the individuals with attributed power see the teacher behaving in congruence with their personal expectations this will be more significant than the congruence of teacher behavior and pupil expectations in general.

3. This will be most true early in the formation of the group.

4. As the group functions over a period of time the expectations and perceptions of the individual with attributed power will merge with the general classroom expectation and perception.

5. Insofar as the teacher's role has high salience in the classroom group this content will be most vivid in the demonstration of the hypothesis.

Such reasoning as this led to the hypothesis: classroom efficiency and effectiveness will be negatively related to the discrepancy between the perceptions and expectations regarding the teacher's leader behavior as these perceptions and expectations are held by the pupil with highest attributed power.

SENTIMENT STRUCTURE

Students of group life have for many years been concerned with affective or emotional aspects of groups. Homans (1950) for instance comments:

> "Now let us go back to our passage again and consider another set of words and phrases: sentiments of affection, affective content of sympathy and indulgence, intimate sympathy, respect, pride, antagonism, affective

> history, scorn, sentimental nostalgia. ...Here we shall call them all sentiments, largely because that word has been used in a less specialized sense than some of the others, and we shall speak of sentiment as an element of social behavior (pp. 37-38)."

Concepts such as cohesiveness, interpersonal attraction, morale, and espirit de corps, have also been utilized to handle similar phenomena.

As this discussion implies, the sentiment concept is troublesome for several reasons: 1) The concept sometimes refers to properties of individuals and sometimes to properties of groups. Most writers have not been clear on this referent. For our purposes we have made reference to sentiment structure as a property of the group. 2) There is no simple or agreed upon taxonomy of "aspects of sentiment." We will make reference to several of these and argue that considerable theoretical work remains to be done in clarifying the concepts. In turn we will focus our attention upon cohesiveness or overall satisfaction, ambivalence of sentiment, congruence in social ranking, concentration of sentiment, and intra clique sentiment.

Cohesiveness: Overall Satisfaction

A variable which has had considerable discussion in social psychology is cohesiveness. Cartwright and Zander (1960) define it conceptually as a property of a group which is a function of individual motives and group activities, interaction and goals. In a very real sense, cohesiveness is a synonym for efficiency. The relationship between our measure of cohesiveness then is an independent assessment of the teacher judgments. It gives us pause also, as we have indicated, concerning the conceptual meaning of our teacher judgments. Cohesiveness should affect effectiveness indirectly through more effort to reach group goals. Cohesiveness was operationalized through the use of a three item questionnaire dealing with satisfaction from the program, the teacher, and the other children.

Ambivalence of Sentiment

Psychologists in their analyses of personal relationships have spoken extensively about conflict wherein an individual is both attracted and repelled by the same object. This suggests that a concern for a simple judgment of "like" or "dislike" might be less important in looking at the group than a recognition of ambivalence and an attempt to specify the amounts of these components and relate them to our effectiveness-efficiency criterion. Hence we obtained statements on the relative amounts of positive to negative sentiment. We operationalized this by the simple procedure of the difference in total number of positive choices to negative choices on the best friends. Previous data (Smith 1958) had suggested that classes varied quite markedly in this regard.

Congruence in Social Rankings

As a third aspect of sentiment structure we looked at the congruence in social rankings (Homans 1961, Zalesnik, et al 1958). Our reasoning is as follows:

1. Social rank refers to the amount of esteem (sentiment) received by a member of a group from the other members.
2. A social rank exists in each group on each dimension of activity important for the group.
3. Congruence refers to the degree to which the social ranks are interrelated.
4. If individuals hold the same rank (congruence) on several dimensions then other members are not in conflict as to how to behave toward them.
5. If an individual knows his rank in the group then he is not in conflict (anxiety) as to how to behave in a group. (If his rank is low he may not like it but he is not in conflict.)
6. If individuals in a group do not understand how they should behave and how others will behave toward them, a group will have difficulty in task accomplishment.

Our hypothesis then is that congruency in social ranking leads to group effectiveness and efficiency.

Congruency in social rank was operationalized in the following manner: each pupil responded to a series of "Guess Who" sociometric type questionnaires regarding ability, achievement, popularity, and attributed power. The questionnaire asked for positive and negative nominations. From these it was possible to develop a hierarchy, a social ranking, for each dimension for each group. Inter-correlations among the rankings were then determined. Comparisons could then be made between all effective-efficient and ineffective-inefficient classes.

Concentration of Sentiment

In the sociometric literature (Northway 1952) one finds reference to "mature sociometric patterning" and other related concepts. Typically what is meant is a classroom in which a few children are "stars" or centers about whom several other children cluster. Typically, also, such insights have not been analyzed and put into a general conceptual framework. Initially we sought to test the insight; ultimately we became curious as to why such a relationship might exist. We would suggest the following reasoning:

1. "Mature sociometric patterning" refers operationally to a particular patterning of choices on a sociometric test, that is clusters about a star.
2. Conceptually, sociometric choices, of the best friends and least liked type, are indications of sentiment.
3. Typically, children will interact more frequently with others they like and will avoid others they dislike.
4. If item 3 is true then sociometric questions can be used as an indirect measure of the amount of interaction among certain individuals.
5. Insofar as some individuals are high and some low in sentiment and interaction, there will be clarity in initiating interaction (giving orders and giving feedback of vital information) and responding to interaction (following orders and accepting feedback information).
6. Clarity in interaction and sentiment lead to effectiveness and efficiency.

The hypothesis then is "mature sociometric patterning" results in more affective-efficient classes.

We have operationalized this dimension by looking at the "concentration of sentiment." Specifically, we have computed popularity hierarchies from the sociometric "best friends" and "least liked" questions. In classes where there is great variability in distributions of positive sentiments there are "clusters" as suggested in the sociometric literature. Similarly, the negative sentiments, as they are quite varied, would suggest clusters. We compared the variability of our good and bad to make the test.

Interclique Sentiment

On occasion in educational psychology, and in the popular literature, one finds discussion of group dissenion, cliques and coalitions in groups. History is replete with accounts of religious groups, large organizations, and national states which splinter into factions. While many such groups, because of their voluntary nature can divide and redivide, classroom groups, because of their non voluntary characteristics which we discussed earlier, cannot do this. We see this as primarily a problem in sentiment structure. Our reasoning is this:

1. Classroom groups are non voluntary groups.
2. For many reasons it is possible for an informal system to develop in which clusters of people center in sentimant and interaction around a central figure.

3. Sentiments among these clusters may vary from positive to negative.

4. If the sentiment is negative that is an important specification of inefficiency.

5. If sentiment is negative then a disruption in communication and coordination occurs.

6. Such disruptions impede locomotion toward general goals.

7. Difficulty in locomotion toward goals is synonymous with ineffectiveness.

The hypothesis then states interclique conflict - negative sentiment - leads to ineffectiveness and inefficiency.

We operationalized interclique conflict in this manner. The two most liked members of the group were determined; the interrelationships between them were judged on a five point scale ranging through these levels: mutual choice, one way positive choice, no sentiment between or one plus and one minus, one way rejection and mutual rejection. The effective-efficient and ineffective-inefficient groups were then compared.

Congruence of Motives and Esteem

In our earlier discussion of cohesiveness and overall satisfaction accruing to the members we raised the position that aspects of the group should bring rewards to the individuals in terms of their motive structure. Earlier also we discussed the impact of motives upon classroom functioning in terms of the demands of classroom groups as particular kinds of groups within a particular kind of an organization. Now we move more analytically into the relationship of the particular motive possessed by an individual and the amount of esteem in relevant areas in which he is held by his peers. Our reasoning is this:

1. Children vary in the kind and strength of learned social motives they possess.

2. Children vary in the kind and amount of esteem they receive.

3. Children whose social motives and received esteem are congruent will be more satisfied.

4. Increases in individual satisfaction are synonymous with increases in group efficiency.

5. Pupils assume that teachers are in control of classroom groups.

6. Perception of satisfaction and dissatisfaction will be attributed, in part, to the teacher.
7. Teachers who are perceived as producers of satisfaction will gain idiosyncracy credits.
8. As teacher idiosyncracy credits are increased then the teacher gains in influence toward institutional goals.

The hypothesis then is: as congruence of social motives and receipt of esteem increases then group effectiveness and efficiency will also increase.

As described earlier, motives were assessed operationally with a set of TAT type pictures and receipt of esteem was operationalized through the use of sociometric questions. The content under consideration included achievement, affiliation and power.

Activity

In the original conception of the problem, we did not make any special analysis of the activities, the things that pupils do in the classroom. We were concerned though with their perceptions of what they were learning. In a sense we have another means of operationalizing effectiveness, in a more general sense we have an indication of the activities of the group. Our reasoning is this:

1. Individual learning is held as a goal by pupils and teachers.
2. One means of conceptualizing activities is amount of learning taking place.
3. Group locomotion refers to the degree of movement toward goals.
4. Movement toward goals is group effectiveness.
5. Efficiency is, in part, a by product of effectiveness.

Our hypothesis states: judgment of amount of learning will be related to effectiveness and efficiency.

This judgment of amount of learning was a simple three point rating scale which was filled in by each pupil.

Summary

In short, we have taken a number of concepts from relevant social and personality theory. We have tried to indicate their reasonableness for analyzing the classroom as a human group. Group effectiveness and efficiency became our dependent variables. We operationalized them with rating scales filled in by the teacher. We combined them into a single criterion for selecting classroom groups with which to work.

Drawing largely from our experience with teachers, with classroom groups of our own, and with general theory, especially that of Homans (1950) and Homans and Riecken (1954) we selected clusters of variables to relate to the effectiveness-efficiency criterion. These clusters of variables we called 1) individual qua group variables, 2) the teacher, interaction, sentiment, and norm, 3) sentiment structure, 4) activity, and 5) congruence of motive and esteem.

DESIGN OF THE STUDY

The broader methodological framework into which this study may be classified is the ex post facto experiment (Greenwood, 1945). In analyzing a variety of research approaches, Greenwood distinguishes between pure or projected experiments, uncontrolled or natural experiments, trial and error experiments, controlled observational study, and ex post facto experiments. The essence of the latter is that the experimenter arrives on the scene after the conditions have taken place and the effects have occurred.

> "Because he has arrived on the scene too late to create an experiment of his own or to watch an experiment created for him by nature, he tries to imagine the experiment in his mind" (p. 13).

The essence of the experiment is contained in these elements: a causal hypothesis, contrasting conditions to test the hypotheses and appropriate controls. In the ex post facto experiment one may proceed from effect back to causes. This has been our procedure.

Selection of the Sample

In a naturalistic ex post facto study it is necessary to describe carefully the selection of the sample. The procedure was this. After obtaining permission from the appropriate senior administrative officer we approached two administrators one of whom was responsible for a group of slum schools and a second one who was responsible for a group of lower-middle class schools.* From these administrators we culled a list of schools with classes fitting our criteria and with principals who would accept us in their buildings. The effects of this sampling on our results are not known.

At this point we made personal contact with each principal, explained the project, and indicated the criteria we had set up. These included:

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*The strategy and tactics in developing a cooperative relationship between university personnel and a public school system is a problem which needs discussion, although not at this point.

1. The classes must be upper elementary: fourth through eighth grade.

2. The classes must be split level, e.g. 5H and 6L.

3. The smaller classroom group must contain at least 10 pupils.

4. The teachers must be willing to make two ratings and allow us several hours of classtime for testing.

The split level criterion requires some elaboration. Our hypotheses related to pupil and group variables which influenced group effectiveness and efficiency. One of the variables we wanted to control was the personality of the teacher. In this sense we wanted a teacher who was teaching two classes, one of which was "going very well" and one of which was not. The St. Louis Public Schools has had for a number of years a system where a teacher might have two grade levels, e.g. a 6 low and a 6 high or a 6 high and a 7 low. These classroom groups, as we shall call them, usually are seated separately, use different text books, and for all academic work are taught as separate classes. The children identify themselves unequivocally as 6 Highs or 7 Lows. In effect, there is no doubt in their minds as to which classroom group they belong. The formal age-grade structure of the elementary school is a vivid reality to them. It had been our experience, in talking with teachers in such a situation, that some of them perceived differences in these groups just as a junior or senior high school teacher would perceive differences in her second and third and fifth hour classes.

Each teacher whose teaching assignment met these criteria was given the rating scales. She rated each classroom group on each of the scales. At this point 55 teachers with 110 classroom groups in schools cooperated in the project. From these ratings we selected those teachers who perceived their classes to be at least one step different on each of the two scales. For example, if she rated one of her groups as average (step 3) on effectiveness and average (step 3) on efficiency then to meet the criterion her other classroom group would have had to have been rated below average (step 2) or very low (step 1) on each of the scales. In effect, we sought differences in both efficiency and effectiveness. As indicated elsewhere these criteria were perceived as similar ($C = .67$) by the teachers. This criterion then reduced our sample to twenty-four teachers and 48 classroom groups. Of these 13 teachers and 26 groups were from lower class communities and 11 teachers and 22 groups were from the lower-middle class communities.

At the time of the design of the study this utilization of two groups meeting in the same time and place with one teacher seemed an excellent research tactic. Later, and as we will discuss in some detail, we began to have some serious doubts concerning this decision.

Data Collection

The data on the independent variables were collected in two testing sessions of approximately 1½ hours each. These sessions typically were in the morning and usually on successive days. The first day battery included, and in this order, 1) an achievement test: social studies or arithmetic, 2) mental health test, 3) pupil ratings of effectiveness and efficiency, and 4) pupil expectations for teacher leader behavior. The second day included the following ordering of testing: 1) an intelligence test, 2) story writing (for motive measures), 3) pupil perceptions of teacher leader behavior, and 4) sociometric nominations. Except in the achievement and intelligence testing, the questions were read to the pupils. In all instances the teacher was not in the room and the data were collected by the principal investigators or the research assistant. Although there was variability in the response of the pupils, most of them seemed to enjoy "getting out of classwork" and most of them attended to the task.*

Statistical Analysis

A variety of statistical techniques were utilized in the analysis of the data. Principally the orientation was this. The classroom group was treated as the unit. In this sense, some average value, usually a mean, was computed for each variable. Since the data were in pairs, about each teacher, the most frequent test of significance employed was the Wilcoxon matched-pairs signed rank test (Siegel, 1956, Wilcoxon, 1949). This test proved quite functional for handling our data. Our major control consisted of teacher personality. Each teacher worked with two groups; these were groups which she perceived to be different. Many of our variables were not normally distributed nor were they measured with interval scales. This particular non parametric statistic, the Wilcoxon matched-pairs signed rank test, has a power efficiency of 95%. The statistic also is useful in the ex post facto experiment because one tests as many relevant alternative hypotheses as possible in that randomization has not been used, as is done in a projected experiment.

RESULTS AND INTERPRETATIONS

The organization of this section follows from several guiding principles. The first of these guidelines is the outline of the hypotheses presented earlier. The second guideline is the analysis and comparison between the two socio-economic levels. Third, we combine results with some interpretation because of the ex post facto type of design which, while testing causal hypotheses, also demands that one look for other correlates or potentially causal variables, alternatives hypotheses not controlled by randomization, and that one integrate these with the general findings. In a sense we have a puzzle, one which we did not create -- as in a projected experiment -- but one which potentially can be ordered and understood. Consequently, as other data are available and pertinent we will present them.

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*One classroom so obviously took the assignment as a lark that the data were omitted from analysis. It is unfortunate that a more extended case study could not have been made of this group for they in a sense typified the variables under investigation.

Individual Qua Group Variables

Intelligence

As predicted, the effective and efficient groups are more able intellectually than the ineffective and inefficient groups. This result holds for both socio-economic levels. Tables 3.2 and 3.3 contain the findings. These findings are generally in accord with the everyday observations of classroom teachers; intellectually able children are, by and large, more responsive and easier to work with in an elementary school classroom.

Insert Tables 3.2 and 3.3 about here

These results suggest two observations worthy of note. First in two of the recent books on social behavior, Homans (1961) and Thibaut & Kelley (1959), the concept of intelligence is not indexed. Perhaps it need not be in a general discussion of social behavior or the social psychology of groups. However, it behooves the educational psychologist to introduce the concept, translate it into more general social system variables, e.g., activities which are more readily available to an individual and which facilitate interaction and which he can trade at a low cost to himself but for high value to another, and explain its impact. Such a translation seems necessary for each of the "individual-qua-group" variables. The importance of this arises especially as one analyzes the phenomena of group or classroom processes. As one's interests shift from prediction or explanation of group differences to the control and manipulation of groups toward desirable educational objectives and especially as the teacher engages in this process, then other concepts are demanded.

It seems to us that the concept of general intelligence needs renewed interest and analysis within education for a second reason. Whatever the genesis of intellectual ability, especially in culturally deprived lower socio-economic area schools, and whatever the between s-e-s differences in intelligence, the variable relates significantly to group functioning, or the teacher's perception of group functioning, in both socio-economic areas. While there remains, even after decades of the most intense research exploration of intelligence, considerable confusion concerning the meaning of general intelligence, our data suggest comparabilities in teaching strategies between social classes. Teachers, as they view and think about the functioning of their classes, seem to be sensitive to the same phenomenon. To argue, as is sometimes done, that the scores are generally meaningless in regard to culturally deprived children is to err--at least as far as our data indicate.

Table 3.2

Intelligence differences between the "I" and "E" classes* for the lower socio-economic groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	95**	98	3	4	
2	90	94	4	6	
3	82	95	13	11	
4	86	102	16	12	
5	86	95	9	9	
6	87	92	5	7	
7	82	99	17	13	
8	96	94	-2	1½	1½
9	90	87	-3	4	4
10	80	88	8	8	
11	87	98	11	10	
12	87	89	2	1½	
13	91	94	3	4	

$T = 5\frac{1}{2}$

$N = 13$

$p < .01$ ***

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* In this Table and in all others of Chapter 3, the "I" groups are the ineffective-inefficient groups and the "E" groups are the effective-efficient groups.

** These numbers are the means of the individual scores for the class as a whole; they have been rounded off for ease in reading and in computation. The total number of children involved in the 48 groups is 707.

*** Probabilities are determined from the Wilcoxon matched pairs signed ranks test (Siegel, 1956).

Table 3.3

Intelligence differences between the "I" and "E" classes in the middle Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	101	105	4	3½	
2	92	102	10	9½	
3	96	104	8	8	
4	107	106	-1	1½	1½
5	106	110	4	3½	
6	97	102	5	5	
7	93	103	10	9½	
8	103	110	7	6½	
9	104	103	-1	1½	1½
10	94	101	7	6½	
11	104	104	0	(omitted)	
					T=3 N=10 p=.01

As we have commented in the rationale, teachers often speak of the difficulties in teaching classes which are heterogeneous in regard to intellectual ability as well as the average differences upon which we have just reported. Our data permitted an assessment of the heterogeneity hypothesis. Contrary to the "common sense of teachers" and to our hypothesis, we found no relationship of variability or heterogeneity of intellectual ability to effectiveness and efficiency. Our "E" were not less variable than our "I" groups. If anything the trend was in the opposite direction. The finding held for both social classes. Data are presented in Tables 3.4 and 3.5. This suggests several fascinating problems in how teachers think about such ability differences and how they then behave on such conceptions in order to maximize effectiveness and efficiency. How these behaviors interact with her behavior to handle the mean differences in ability (which we did find as significantly different) also is an appropriate question.

Insert Tables 3.4 and 3.5 about here

Mental Health

In the present analysis we found that, overall, the "E" groups had higher mental health than the "I" groups. The findings were in the same direction in both s-e-s areas but statistically significant only in the lower s-e-s classes. Tables 3.6 and 3.7 contain these data.

Insert Tables 3.6 and 3.7 about here

Many of the same phenomena and kinds of questions raised regarding intelligence occur in regard to mental health. It is our belief that a structural and evaluative personality variable such as mental health requires analysis into the specific behaviors or activities which compose it and which co-vary with it. The stimulus conditions which control these behaviors require specification. Such a functional analysis and attendant research will clarify the concept and will also indicate the relationships between change in mental health and classroom tasks or activities, classroom interaction between teacher and pupil and between pupil and pupil, classroom norms, and classroom sentiment. In this regard, the stage opens for a consideration of the process by which the teacher thinks through and then deals with such differences in classroom groups. Such questions should feed very fluently into thought about special classes for the mentally unhealthy and should permit needed integration of generalizations from such special classes to the regular classroom situation.

Table 3.4

Heterogeneity of intelligence between the "I" and "E" classes for the lower socio-economic sample.

Teacher	"I"	"E"	"Difference"	Rank of Difference	Rank with less Frequent Sign
1	11	7	4	10½	10½
2	10	12	-2	5	
3	9	7	2	5	5
4	11	9	2	5	5
5	11	11	0	Omitted	
6	11	13	-2	5	
7	4	10	-6	12	
8	8	9	-1	1	
9	8	10	-2	5	
10	5	7	-2	5	
11	5	9	-4	10½	
12	4	6	-2	5	
13	8	5	3	9	9

T=29½
N=12
p=N.S.

Table 3.5

Heterogeneity of intelligence between the "I" and "E" classes for the middle socio-economic sample.

Teacher	"I"	"E"	Difference	Rank of Difference	Rank with less Frequent Sign
1	6	9	-3	4	
2	13	7	6	7½	7½
3	4	15	-11	10	
4	13	11	2	3	3
5	16	9	7	9	9
6	11	11	0	omitted	
7	6	11	-5	5½	
8	10	9	1	1½	1½
9	7	12	-5	5½	
10	6	7	-1	1½	
11	5	11	-6	7½	

T=21
N=10
p = N.S.

Table 3.6

Mental Health Differences between the "I" and "E" classes in the Lower Socio-Economic Sample.

Teacher	I	E	Differences	Rank of Differences	Rank with less Frequent Sign
1	75	84	9	10	
2	70	80	10	11	
3	79	86	7	7½	
4	85	86	1	1	
5	78	76	-2	3	-3
6	79	82	3	5	
7	82	74	-8	4	-9
8	75	82	7	7½	
9	72	74	2	3	
10	74	87	13	12	
11	75	81	6	6	
12	85	83	-2	3	-3
13	83	83	0	(omitted)	

T=15
N=12
$p < .05$

Table 3.7

Mental Health Differences between the "I" and "E" classes in the Middle Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	80	85	5	8	
2	70	67	-3	5½	-5½
3	84	82	-2	3½	-3½
4	88	85	-3	5½	-5½
5	83	91	8	10	
6	78	79	1	1½	
7	75	85	10	11	
8	77	82	5	8	
9	79	84	5	8	
10	73	74	1	1½	
11	85	83	-2	3½	-3½

$T = 18$
$N = 11$
$p < .20 > .10$

Further, we would remark on the comparibility in our data between the two social classes. Regardless of possible differences in average level of mental health between social classes, the smoothly functioning classroom groups tend to contain better adjusted children. This would suggest that in regard to this variable the mode of approach to teaching in middle or lower social class neighborhoods while possibly different in degree would not be different in kind.

Again, theorizing from the general educational bias that variability of groups increases the difficulty of teaching we predicted that variability in mental health would be negatively related to effectiveness and efficiency. Our data do not support this hypothesis. There was no difference between the "I" and "E" classes in mental health heterogeneity for either socio economic sample. In the middle s-e-s sample, the trend was in the direction toward more variability in the "E" group. Such findings would suggest that removing mentally unhealthy children from regular classes might improve functioning in terms of the obtained average level of behaviors correlated with ill health rather than from some consequence of heterogeneity.

Also our data would cast doubt on the discussion that removing one troublesome child (assuming the the mentally unhealthy child is more probably troublesome) only creates a vacuum into which the next most troublesome one will move. This supports the more clinical assertion of Herminghaus (1959) that special classes for the "socially maladjusted child" produces benefits in the "climate" of the class from which he is drawn. Data are in Tables 3.8 and 3.9.

Insert Tables 3.8 and 3.9 about here

Finally, and somewhat parenthetically in terms of our data, we have concern about the terminology in which this dimension is couched. On the one hand the mental health concept is maligned when the bad word "adjustment" is used. On the other hand it is seen as an important civic problem when defined as mental illness or juvenile delinquency. However phrased, or whichever concept is used, our results would suggest that for certain purposes this is an important variable for classroom functioning. Theoreticians within education would do a service to clarify the terminology, separate the value components, and generally do a logical analysis of the issues so that scientific study might proceed.

Table 3.8

Differences in Variability in Mental Health between the "I" and "E" Classes in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	10	8	2	6	
2	13	13	0	(omitted)	
3	10	9	1	3	
4	12	8	4	7½	
5	9	15	-6	9	-9
6	12	12	0	(omitted)	
7	10	11	-1	3	-3
8	10	9	1	3	
9	16	15	1	3	
10	22	7	15	10	
11	12	11	1	3	
12	7	11	-4	7½	-7½
13	10	10	0	(omitted)	

T = -19½
N = 10
p = N.S.

Table 3.9

Differences in Variability in Mental Health between the "I" and the "E" Classes in the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	18	10	8	9½	9½
2	5	20	-15	11	
3	9	14	- 5	8	
4	8	16	- 8	9½	
5	9	11	- 2	4	
6	14	15	- 1	1½	
7	10	12	- 2	4	
8	12	16	- 4	7	
9	12	11	1	1½	1½
10	17	15	2	4	4
11	10	13	- 3	6	

T = 15
N = 11
p = N.S.*

* Since all hypotheses were stated as directional one tailed tests were used. Occassionally the data fell in a direction contrary to hypothesis. Because of the nature of our predictions we cannot indicate the probabilities in these instances. The results are interpreted then as non significant. Such "trends" suggest important leads for new theory and research.

Motivation

In general, the predictions concerning the relationship between the motive variables and classroom functioning were only partially supported. As indicated in the methodology section, the fantasy responses to four stimulus pictures were scored for presence or absence of relevant imagery. Computations of the percentage of the group presenting such imagery allowed comparisons by groups between the "E" and "I" classes.

Results on achievement needs differed between the two social classes. In the lower socio-economic sample no differences in achievement imagery occured between the ineffective-inefficient classes, "I", and the effective-efficient classes, "E". The data did not support the prediction. Table 3.10 contains these findings. In contrast, support for the predictions occurred in the middle class schools. The "E" classes contained significantly more students with n Achievement than the "I" classes. These data are in Table 3.11.

Insert Tables 3.10 and 3.11 about here

While achievement motivation has often been found to occur in greater frequency among middle class individuals in contrast to those from lower classes, and the distributions from our data would suggest this also, the puzzling finding remains. Frequency of achievement motivation relates to group effectiveness and efficiency only in the middle class group. The demands and pressures of the institutions and teaching staffs seemingly must vary between economic levels. The mode of approach by the classroom teacher becomes a most interesting problem. A number of questions arise at each step of the reasoning which entered into the hypotheses.

The findings are equally intriguing in regard to the presence of affiliation motivation. In this instance the predictions are supported (T is within one point of the .05 level) for the lower s-e-s classrooms. Greater frequency of affiliation imagery occurred in the "E" classes in contrast to the "I" classes of the lower socio-economic schools. No differences occured in the middle s-e-s- schools, although the trend was in the opposite direction. Tables 3.12 and 3.13 contain this information.

Insert Tables 3.12 and 3.13 about here

Table 3.10

Difference in Percentage of Achievement Motivation in "I" and "E" Classes for the Lower Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	14	36	22	11	11
2	8	18	10	6	6
3	11	45	34	13	13
4	58	45	-13	7	
5	26	20	-6	4	
6	48	42	-6	4	
7	0	18	18	9	9
8	20	0	-20	10	
9	29	14	-15	8	
10	50	56	6	4	4
11	17	15	-2	1½	
12	38	36	-2	1½	
13	36	12	-24	12	

T = 44
N = 13
p = N.S.

Table 3.11

Differences in Percentage of Pupils with Achievement Motivation in "I" and "E" Classes for the Middle Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	0	48	48	11	
2	50	18	-32	9	-9
3	33	47	14	5½	
4	75	89	14	5½	
5	30	43	13	3½	
6	11	24	13	3½	
7	50	48	-2	1	-1
8	40	64	24	7	
9	18	15	-3	2	-2
10	25	54	29	8	
11	38	71	33	10	

$T = 12$
$N = 11$
$p < .05$

Table 3.12

Difference in Percentage of Affiliation Motivation in "I" and "E" Classes for the Lower Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	62	63	1	1	
2	64	41	-23	9	-9
3	44	72	28	10	
4	33	70	37.	11	
5	42	50	8	3	
6	38	83	45	13	
7	50	94	44	12	
8	60	56	-4	2	-2
9	38	28	-10	5	-5
10	17	39	22	8	
11	33	54	21	7	
12	75	63	-12	6	-6
13	41	50	9	4	

T = -22
N = 13
$p < .10 > .05$

Table 3.13

Difference in Percentages of Affiliation Motivation in "I" and "E" Classes for the Middle Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	78	55	-23	8	
2	17	64	47	11	11
3	78	52	26	9	
4	62	67	5	2	2
5	70	61	-9	4½	
6	89	52	-37	10	
7	67	56	-9	4½	
8	60	82	22	7	7
9	46	65	19	6	6
10	75	69	-6	3	
11	50	47	-6	1	

T = 26
N = 11
p = N.S.

Questions arise once again concerning the reasoning underlying the hypotheses. Further research on the demands of the institutions, the values of the teachers, and the strategies teachers use in coping with children are necessary. The need for a more discriminating theory of teaching and classroom functioning in which distinctions are made between the two socio-economic neighborhoods seems desirable from these findings. It should be noted that the intelligence and mental health data did not show these contrasing relationships with effectiveness and efficiency between the two s-e-s samples.

While power imagery was present in the stories of the children, the frequency of occurrence in the classrooms was unrelated to the effectiveness and efficiency of the groups in either socio-economic level. This aspect of pupil personality, in spite of our theorizing, seems unimportant for these aspects of group functioning. Tables 3.14 and 3.15 report these data.

Insert Tables 3.14 and 3.15 about here

The Teacher: Interaction, Sentiment and Norm

As we have indicated, one of our most basic series of hypotheses rested on this kind of an argument. The teacher's role in the group can be analyzed in terms of leader behavior. Leader behavior can be dimensionalized, after the Ohio State University leadership studies, into Initiating Structure and Consideration. Teachers, as they meet pupil expectations in these roles gain idiosyncracy credits, power, and influence; as they do not meet pupil expectations they increase idiosyncracy debits and lose influence and control over the group. On the basis of this kind of reasoning and a considerable body of relevant research literature we predicted that the teacher's behavior would be different for each group, the pupils would expect and would perceive her behavior as different, and finally that the discrepancies between the group expectations, i.e., the norm, and the group perception would be greater for the ineffective and inefficient groups. Our data in toto did not support these contentions. The analysis will begin with the Consideration dimension of the modified Leader Behavior Description Questionnaire and then move to an analysis of the Initiating Structure dimension.

Teacher Leader Behavior: Consideration

The norms concerning leader behavior of each group were determined by asking pupils to indicate how they thought the teacher should behave on each of the dimensions. The scores were averaged for each class. We have called these Expectations for Teacher Consideration. Tables 3.16 and 3.17 contain the data for each social class and indicate the relationship between the expectations and effectiveness and

Table 3.14

Differences in Percentages of Power Motivation in "I" and "E" Classes for the Lower Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	24	45	-21	7	
2	14	41	-27	9	
3	44	50	-6	2½	
4	58	70	-12	5	
5	21	50	-29	10	
6	33	67	-34	11	
7	67	23	44	12	12
8	27	11	16	6	6
9	29	29	0	(omitted)	
10	50	44	6	2½	2½
11	33	38	-5	1	
12	62	36	26	8	8
13	27	38	-11	4	

T = 30½
N = 12
p = N.S.

Table 3.15

Differences in Percentages of Power Motivation in "I" and "E" Classes for the Middle Socio-Economic Groups.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	67	52	17	6	
2	17	27	-10	5	5
3	22	52	-30	8	8
4	38	45	-7	3	3
5	70	30	40	10	
6	44	43	1	1	
7	17	20	-3	2	2
8	60	29	31	9	
9	63	45	18	7	
10	38	38	0	(omitted)	
11	38	47	-9	4	4

T = 22
N = 10
p = N.S.

efficiency. As tabled, no relationship, e.g., no differences exist between the norms of the "I" classes and the "E" classes for either socio-economic sample.

Insert Tables 3.16 and 3.17 about here

The pupils' perceptions of the teachers behavior on the Leader Behavior Description Questionnaire yielded indices of what Loomis (1961) calls the belief system. Tables 3.18 and 3.19 contain these data. They indicate interesting relationships with effectiveness and efficiency. In the lower socio-economic sample the data do not support the hypothesis that the "E" groups perceive the teacher as higher in Consideration. In fact, the trend is in the reverse direction. In the middle s-e-s sample, the hypothesis is supported between the .05 and .10 level, e.g., the trend is toward the group seeing the teacher as higher in Consideration.

Insert Tables 3.18 and 3.19 about here

In the analysis of the discrepancy scores within classes a whole series of questions can be raised. We will take them in turn. First, our data indicate that pupils consistently find that the teachers do not provide as much Consideration behavior as the pupils want. Tables 3.20, 3.21, 3.22 and 3.23 contain these findings. They suggest broader implications for teacher-pupil interaction in the classroom and the development of positive sentiment in the social system and individual attitude toward learning.

Insert Tables 3.20, 3.21, 3.22 and 3.23 about here

When the discrepancies concerning Consideration are tabled, e.g, the degree to which the teachers are meeting the norms, the results for the lower social classes do not support the hypothesis. The "E" classes contain larger amounts of differences between the expected and perceived teacher behavior in Consideration. In terms of our theoretical statement we predicted that the teacher's inability to meet the norms of the group would lose idiosyncracy credits and thereby lessen her power and the response to orders and influence. This was not true in our data as presented in Table 3.24. In fact, the trend is in the reverse direction. Contrary findings occur in the middle socio-economic sample. In these classes the hypothesis is supported: the classes which are effective and efficient as defined by our criteria are the classes in which the teacher's behavior, as perceived by the pupils is more congruent with the

Table 3.16

Differences in Expectations of Teacher Consideration in "I" and "E" Classes for the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	44	47	3	6½	
2	45	48	3	6½	
3	46	42	-4	9½	9½
4	42	45	3	6½	
5	41	46	5	11½	
6	45	49	4	9½	
7	44	46	2	3	
8	45	43	-2	3	3
9	42	44	2	3	
10	46	47	1	1	
11	48	43	-5	11½	11½
12	46	43	3	6½	
13	46	46	0	(omitted)	

T = 24
N = 12
p = N.S.

Table 3.17

Differences in Expectation of Teacher Consideration in "I" and "E" Classes for the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	49	50	1	1½	
2	42	44	2	4½	
3	42	43	1	1½	
4	44	47	3	8	
5	45	43	-2	4½	-4½
6	40	42	2	4½	
7	41	44	3	8	
8	48	44	-4	10	-10
9	50	47	-3	8	-8
10	47	47	0	(omitted)	
11	44	46	2	4½	

T = 22½
N = 10
p = N.S.

Table 3.19

Differences in Perceptions of Consideration in "I" and "E" Classes for the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	39	41	2	2½	2½
2	37	41	4	7	7
3	42	45	3	5	5
4	41	40	-1	1	
5	29	22	-7	10½	
6	36	36	0	(omitted)	
7	46	43	-3	5	
8	42	37	-5	8½	
9	40	35	-5	8½	
10	50	48	-2	2½	
11	45	35	-10	12	
12	41	34	-7	10½	
13	36	39	3	5	5

T = 19½
N = 12
p = N.S.

Table 3.19

Difference in Perceptions of Considerations in "I" and "E" Classes for the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	44	48	4	4	
2	32	38	6	5	
3	39	42	3	3	
4	36	37	1	1	
5	34	34	0	(omitted)	
6	34	41	7	8	
7	39	41	2	2	
8	35	41	6	5	
9	45	45	0	(omitted)	
10	34	25	-9	9	-9
11	28	39	6	5	

$T = 9$
$N = 9$
$p < .10 > .05$

Table 3.20

Differences in Expectations and Perceptions of Teacher Consideration Behavior for the "I" Classes in the Lower Socio-Economic Sample.

Teacher	Expectations	Perceptions	Difference	Rank	Rank with less Frequent Sign
1	44	39	5	8½	
2	45	37	8	11	
3	46	42	4	6½	
4	42	41	1	1	
5	41	29	12	13	
6	45	39	6	10	
7	44	46	-2	2½	-2½
8	45	42	3	4½	
9	42	40	2	2½	
10	46	50	-4	6½	-6½
11	48	45	3	4½	
12	46	41	5	8½	
13	46	36	10	12	

T = -9
N = 13
P < .01

Table 3.21

Differences in Expectations and Perceptions of Teacher Consideration Behavior for the "E" Classes in the Lower Socio-Economic Sample.

Teacher	Expectations for Consideration	Perceptions of Consideration	Difference	Rank of Difference	Rank with Less Frequent Sign
1	47	41	6	5½	
2	48	41	7	7½	
3	42	45	-3	2½	-2½
4	45	40	5	4	
5	46	22	24	13	
6	49	36	13	12	
7	46	43	3	2½	
8	43	37	6	5½	
9	44	35	9	10½	
10	47	48	-1	1	-1
11	43	35	8	9	
12	43	34	9	10½	
13	46	39	7	7½	

T = -3½
N = 13
P < .01

Table 3.22

Differences in Expectations and Perceptions of Teacher Consideration Behavior for the "I" Classes in the Middle Socio-Economic Sample.

Teacher	Expectations for Consideration	Perceptions of Consideration	Difference	Rank of Difference	Rank with Less Frequent Sign
1	49	44	5	3½	
2	42	32	10	7	
3	42	39	3	2	
4	44	36	8	6	
5	45	34	11	8	
6	40	34	6	5	
7	41	39	2	1	
8	48	35	13	9½	
9	50	45	5	3½	
10	47	34	13	9½	
11	44	28	16	11	

$T = 0$
$N = 11$
$p < .01$

Table 3.23

Differences in Expectations and Perceptions of Teacher Consideration Behavior for the "E" Classes in the Middle Socio-Economic Sample.

Teacher	Expectations for Consideration	Perceptions of Consideration	Difference	Rank of Difference	Rank with Less Frequent Sign
1	50	48	2	4½	
2	44	38	6	7	
3	43	42	1	2	
4	47	37	10	9	
5	43	34	9	8	
6	42	41	1	2	
7	44	41	3	6	
8	44	41	1	2	
9	47	45	2	4½	
10	47	25	22	11	
11	46	34	12	10	

T = 0
N = 11
p < .01

expectations or norms of the class members. Table 3.25 contains these data.

Insert Tables 3.24 and 3.25 about here

Teacher Leader Behavior: Initiating Structure

The expectations or norms, for Initiating Structure on the part of the teacher while showing considerable variability from class to class do not show any relationships to the effectiveness and efficiency criteria. As indicated in Tables 3.26 and 3.27, no differences occur between the "I" and the "E" classes.

Insert Tables 3.26 and 3.27 about here

The pupils' perceptions of the teachers' Initiating Structure behavior also is not related to effectiveness and efficiency. Pupils in the "I" classes do not perceive the teacher to be behaving differently toward them as contrasted with the perceptions of the pupils in the "E" classes. These data are presented in Tables 3.28 and 3.29.

Insert Tables 3.28 and 3.29 about here

The data on Initiating Structure are quite in contrast to the Consideration data where in each cluster of class groups lower s-e-s- "I", lower s-e-s- "E", middle s-e-s- "I" and middle s-e-s- "E" (and in almost every actual classroom group itself, 41/45) reported less perceived Consideration than expected Consideration. The data uniformly indicate no differences in the amount of Initiating Structure desired and the amount observed. This finding held in the lower socio-economic sample for both the "I" and the "E" classes; it held also in the middle socio-economic sample for both the "I" and the "E" classes. These data are reported in tables 3.30, 3.31, 3.32 and 3.33.

Insert Tables 3.30 through 3.33 about here

Table 3.24

Differences in Discrepancies of Expected and Berceived Consideration Behavior between the "I" and "E" Classes in the Lower Socio-Economic Sample.

Teacher	"I" Classes Discrepancies in Perceived and Expected Consideration	"E" Classes Discrepancies in Perceived and Expected Consideration	Difference in the Discrepancies	Rank of Difference	Rank with less Frequent Sign
1	5	6	-1	2½	
2	8	7	+1	2½	+2½
3	4	-3	+1	2½	+2½
4	1	5	- 4	8½	
5	12	24	-12	13	
6	6	13	-7	11½	
7	-2	3	-1	2½	
8	3	6	-3	6	
9	2	9	-7	11½	
10	-4	-1	+3	6	+6
11	3	8	-5	10	
12	5	9	-4	8½	
13	10	7	+ 3	6	+6

T = 17
N = 13
p = N.S. *

*Results are contrary to our prediction

Table 3.25

Differences in the Discrepancies of Expected and Perceived Consideration between the "I" and "E" Classes in the Middle Socio-Economic Sample.

Teacher	"I" Classes Discrepancies in Expected and Perceived Consideration	"E" Classes Discrepancies in Expected and Perceived Consideration	Difference in the Discrepancies	Rank of Difference	Rank with less Frequent Sign
1	5	2	3	5½	
2	10	6	4	7½	
3	3	1	2	3	
4	8	10	-2	3	-3
5	11	9	2	3	
6	6	1	5	9	
7	2	3	-1	1	-1
8	13	1	12	11	
9	5	2	3	5½	
10	13	22	-9	10	-10
11	16	12	4	7½	

T = -14
N = 11
p = .05

Table 3.26

Differences in Expectations of Teacher Initiating Structure in "I" and "E" Classes for the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	45	46	-1	-2½	
2	47	50	-3	-11½	
3	45	47	-2	-7½	
4	46	48	-2	-7½	
5	43	44	-1	-2½	
6	47	49	-2	-7½	
7	51	48	3	11½	11½
8	51	49	2	7½	7½
9	48	49	-1	-2½	
10	51	47	4	13	13
11	49	47	2	7½	7½
12	50	48	2	7½	7½
13	49	50	-1	2½	

T = 47
N = 13
p = N.S.

Table 3.27

Differences in Expectations of Teacher Initiating Structure in "I" and "E" Classes for the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	48	46	-2	3½	-3½
2	40	45	5	7	
3	39	48	9	9	
4	46	50	4	6	
5	47	48	1	1½	
6	42	42	0	(omitted)	
7	45	46	1	1½	
8	45	47	2	3½	
9	50	50	0	(omitted)	
10	55	47	-8	8	-8
11	46	49	3	5	

$T = -11\frac{1}{2}$

$N = 9$

$p =$ N.S.

Table 3.28

Differences in Perceptions of Initiating Structure in the "I" and "E" Classes for the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	45	45	0	(omitted)	
2	46	47	1	1½	1½
3	45	52	7	10	10
4	47	43	-4	4½	
5	41	45	4	4½	4½
6	48	52	4	4½	4½
7	51	50	-1	1½	
8	52	47	-5	7½	
9	45	45	0	(omitted)	
10	53	48	-5	7½	
11	49	43	-6	9	
12	47	43	-4	4½	
13	49	49	0	(omitted)	

T = 20½
N = 10
p = N.S.

Table 3.29

Differences in Perceptions of Initiating Structure in "I" and "E" Classes for the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	47	46	-1	1	-1
2	44	46	2	3	
3	41	47	6	8	
4	49	48	0	(omitted)	
5	48	48	0	(omitted)	
6	41	44	3	6	
7	45	48	3	6	
8	47	47	0	(omitted)	
9	50	48	-2	3	-3
10	52	49	-3	6	-6
11	47	45	-2	4	-4

T = 14
N = 8
p = N.S.

Table 3.30

Differences in Expectations and Perceptions of Teacher Initiating Structure Behavior for the "I" Classes in the Lower Socio-Economic Sample.

Teacher	Expectations	Perceptions	Difference	Rank of Difference	Rank with less Frequent Sign
1	45	45	0	(omitted)	
2	47	46	1	2½	
3	45	45	0	(omitted)	
4	46	47	-1	2½	-2½
5	43	41	2	5½	
6	47	48	-1	2½	-2½
7	51	51	0	(omitted)	
8	51	52	-1	2½	-2½
9	48	45	3	7½	
10	51	53	-2	5½	-5½
11	49	49	0	(omitted)	
12	50	47	3	7½	
13	49	49	0	(omitted)	

T = 13
N = 8
p = N.S.

Table 3.31

Differences in Expectations and Perceptions of Teacher Initiating Structure Behavior of the "E" Classes in the Lower Socio-Economic Sample.

Teacher	Expectations	Perceptions	Difference	Rank of Difference	Rank with less Frequent Sign
1	46	45	+ 1	2½	
2	50	47	+3	7½	
3	47	52	-5	12	-12
4	48	43	5	12	
5	44	45	-1	2½	-2½
6	49	52	-3	7½	-7½
7	48	50	-2	5½	-5½
8	49	47	2	5½	
9	49	45	4	9½	
10	47	48	-1	2½	-2½
11	47	43	4	9½	
12	48	43	5	12	
13	50	49	1	2½	

T = 30
N = 13
p = N.S.

Table 3.32

Differences in Expectations and Perceptions of Teacher Initiating Structure Behavior for the "I" Classes in the Middle Socio Economic Sample.

Teacher	Expectations	Perceptions	Difference	Rank of Difference	Rank with less Frequent Sign
1	48	47	1	2½	2½
2	40	44	-4	9	
3	39	41	-2	5½	
4	46	49	-3	7½	
5	47	48	-1	2½	
6	42	41	1	2½	2½
7	45	45	0	(omitted)	
8	45	47	-2	5½	
9	50	50	0	(omitted)	
10	55	52	3	7½	7½
11	46	47	-1	2½	

T = 12½
N = 9
p = N.S.

Table 3.33

Differences in Expectations and Perceptions of Teacher Initiating Structure Behavior for the "E" Classes in the Middle Socio-Economic Sample

Teacher	Expectations	Perceptions	Difference	Rank of Difference	Rank with less Frequent Sign
1	46	46	0	(omitted)	
2	45	46	-1	2	
3	48	47	1	2	2
4	50	49	-1	2	
5	48	48	0	(omitted)	
6	42	44	-2	5 1/2	
7	46	48	-2	5 1/2	
8	47	47	0	(omitted)	
9	50	48	2	5 1/2	5 1/2
10	47	49	-2	5 1/2	
11	49	45	4	8	8
					T = 15 1/2
					N = 8
					p = N.S.

The analysis of the discrepancies between perceptions and expectations, that is, the departure of the teacher's behavior from the classroom norms indicates that our major hypothesis concerning this aspect of teacher leader behavior is not supported. The "I" classes are not more discrepant than the "E" classes. In fact, in the lower socio-economic sample there is a discrepancy in the other direction. These data are reported in Tables 3.34 and 3.35.

Insert Tables 3.34 and 3.35 about here

Activity

Our one hypothesis concerning group activities stated that in the effective and efficient groups the students would judge more learning to be taking place, that is the group would be moving toward its goals. This hypothesis was not supported, although the trend was in the right direction in the lower socio-economic sample. Tables 3.36 and 3.37 contain these data.

Insert Tables 3.36 and 3.37 about here

Once again we are led to raise question with the theoretical statements, both in the assumptions and in the chain of propositions leading to the hypothesis. Finally, our simple rating scale requires further analysis.

Table 3.34

Differences in Discrepancies of Expected and Perceived Initiating Structure Behavior between the "I" and "E" Classes in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	0	1	-1	3½	
2	1	3	-2	8½	
3	0	5	-5	13	
4	-1	5	-4	11½	
5	2	1	1	3½	3½
6	1	3	-2	8½	
7	0	2	-2	8½	
8	1	2	-1	3½	
9	3	4	-1	3½	
10	2	1	1	3½	3½
11	0	4	-4	11½	
12	3	5	-2	8½	
13	0	1	-1	3½	

T = 7
N = 13
p = N.S.*

*Results are contrary to the hypothesis.

Table 3.35

Differences in Discrepancies of Expected And Perceived Initiating Structure Behavior between the "I" and "E" Classes in the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	1	0	1	3	
2	4	1	3	10½	
3	2	1	1	3	
4	3	1	2	7½	
5	1	0	1	3	
6	1	2	-1	-3	3
7	0	2	-2	-7½	7½
8	2	0	2	7½	
9	0	2	-2	-7½	7½
10	3	2	1	3	
11	1	4	-3	-10½	10½

T = 28½
N = 11
p = N.S.

Table 3.36

Differences in Activities Locomoting Toward Goals between the "I" abd "E" Classes in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with Less Frequent Sign
1	1.1	1.6	.5	10½	
2	1.4	1.5	.1	1	
3	1.1	1.5	.4	7	
4	1.5	1.9	.4	7	
5	.8	1.3	.5	10½	
6	1.2	.6	-.6	12	-12
7	1.4	1.8	.4	7	
8	1.2	1.6	.4	7	
9	1.4	1.6	.2	3	
10	1.9	1.7	-.2	3	-3
11	1.8	1.4	-.4	7	-7
12	1.4	1.6	.2	3	
13	1.8	1.8	0	(omitted)	

T = -22
N = 12
p = N.S.

Table 3.37

Differences in Activities Locomoting Toward Goals between the "I" and "E" Classes in the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	1.7	1.6	-.1	1½	
2	1.0	1.4	.4	8½	8½
3	1.6	1.4	-.2	4	
4	1.8	1.8	0	(omitted)	
5	1.6	1.6	0	(omitted)	
6	1.6	1.4	-.2	4	
7	1.4	1.5	.1	1½	1½
8	1.7	1.4	-.3	6½	
9	1.8	1.6	-.2	4	
10	1.9	1.6	-.3	6½	
11	1.2	1.6	.4	8½	8½

T = 18½
N = 9
p = N.S.

Sentiment Structure

As we have indicated, the concept of sentiment is crucial to a discussion of group functioning. We have suggested five aspects of sentiment as a group variable; these are: cohesiveness, ambivalence of sentiment, congruence in social ranking, sentiment concentration, and interclique sentiment. The discussion of results concerning these variables follows this outline.

Cohesiveness: Overall Satisfaction

The pupils in the "I" and the "E" classes completed brief questionnaires regarding their satisfaction with their activities, their classmates, and their teachers. Our hypothesis was that their satisfactions would be related to the effectiveness-efficiency criterion. As we noted, conceptually this is almost a redundancy, and these ratings might well be an operational definition of a more restricted criterion of efficiency. The data, as reported in Tables 3.38 and 3.39, are in the direction of the hypotheses in both socio-economic samples although significantly so only in the middle socio-economic sample.

Insert Tables 3.38 and 3.39 about here

Such partial support in contrast to a more general practical as well as statistical difference raises the serious issue of the nature of our independent variable. As we will comment shortly in our Summary and Conclusions to this chapter the variable teacher conceptions of classroom efficiency is not identical at the operational level with pupil conceptions of classroom efficiency. Only a more abstract theoretical analysis with new empirical observations can clarify this. Such results and interpretations are part of our reason for the stress in chapter four on the functions of analysis and theory in educational research.

Sentiment Ambivalence

As we have stated in our theoretical discussion ambivalence of sentiment, or adient-avoidant conflict when one is discussing an individual, is conceptually a potentially important aspect of group structure. We utilized the frequency of sociometric nominations of "best friends" and the frequency of sociometric nominations of "least liked" to tap the ambivalence of sentiment in each classroom group. We hypothesized that the "I" groups, the ineffective and inefficient groups, would contain stronger negative components than the "E" groups. The data (Tables 3.40 and 3.41) did not support this hypothesis. In the lower s-e-s sample the trend was in the right direction ($p < .10 > .05$); in the middle s-e-s sample there were no differences.

Insert Tables 3.40 and 3.41 about here

Table 3.38

Differences in Amounts of Overall Sentiment Expressed by Pupils Between the "I" and "E" Groups in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	2.9	4.3	1.4	12	
2	2.8	3.3	.5	5½	
3	2.9	4.0	1.1	11	
4	3.6	4.1	.5	5½	
5	2.9	3.8	.9	10	
6	2.5	2.2	-.3	-3½	-3½
7	3.3	3.9	.6	7	
8	3.4	4.1	.7	8½	
9	3.7	3.4	-.3	-3½	-3½
10	5.0	4.3	-.7	-8½	-8½
11	4.7	2.7	-2.0	-13	-13
12	3.4	3.5	.1	1½	
13	3.5	3.6	.1	1½	

T = 28½
N = 13
p = N.S.

Table 3.39

Differences in Amounts of Overall Sentiment Expressed by Pupils Between the "I" and "E" Group in the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	4.4	4.6	2	6	
2	2.9	4.4	1.5	9½	
3	4.9	4.9	0	(omit)	
4	3.9	3.4	-.5	-7	-7
5	3.7	4.3	.6	8	
6	4.0	4.1	.1	3	
7	3.7	3.8	.1	3	
8	3.1	4.6	1.5	9½	
9	4.4	4.3	-.1	-3	-3
10	2.6	2.7	.1	3	
11	3.7	3.8	.1	3	

T = -10
N = 10
p = .05

Table 3.40

Sentiment Ambivalence: Differences in Average Number of Positive and Negative Choice in Best Friends in the "I" and the "E" Groups with the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	.9	.5	- .4	4½	-4½
2	.2	1.0	.8	9	
3	1.0	1.2	.2	1½	
4	.8	1.0	.2	1½	
5	.0	.4	.4	4½	
6	1.8	.8	-1.0	11½	-11½
7	.7	.3	- .4	4½	-4½
8	.6	.2	- .4	4½	-4½
9	.5	1.4	.9	10	
10	1.1	1.7	.6	7½	
11	- .2	.4	.6	7½	
12	.8	1.8	1.0	11½	
13	1.2	2.6	1.4	13	

T = 25
N = 13
$p \langle 10 \rangle .05$

Table 3.41

Sentiment Ambivalence: Differences in Average Number of Positive and Negative Choice in Best Friends in the "I" and the "E" Groups with the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	2.1	1.0	-1.1	7	
2	1.0	1.7	.7	5	5
3	2.4	.3	-2.1	11	
4	2.2	.4	-1.8	10	
5	1.6	1.3	- .3	3	
6	.8	.6	- .2	1½	
7	- .5	.7	1.2	8	8
8	.4	1.4	1.0	6	6
9	.4	- .2	- .2	1½	
10	1.4	.1	-1.3	9	
11	1.6	1.2	- .4	4	

T = 19
N = 11
p = N.S.

(Direction contrary to hypothesis.)

Concentration of Sentiment

We have hypothesized that concentration of sentiment or " mature sociometric patterning" results in more effective and efficient groups. We operationalized this in terms of variability on the likes-dislikes questions of the sociometric procedures. Tables 3.42, 3.43, 3.44, and 3.45 contain these results. Once again we find partial support of the hypothesis. The "E" groups in the middle class sample are all in the predicted direction, the "E" groups in the lower class sample are in the right direction and approach significance ($p \langle .10 \rangle .05$) when the data on concentration of positive sentiments are analyzed. The hypothesis is supported also with the concentration of negative sentiment in that all of the middle class groups have a higher concentration of sentiment. The lower social class sample of groups is not significantly different. Our data are in accord with Muldoon's (1955) finding that concentrations of sentiment tend to be related but our data contrast with his interpretation of the relationship to effectiveness and efficiency. The analysis of the process of classroom functioning with particular attention to the variables mediating between our independent and dependent variables seems to deserve high priority in next research steps. This seems particularly true also on the unanimous finding with the middle socio-economic sample of classroom groups and the "trend" in the lower socio-economic groups.

Insert Tables 3.42, 3.43, 3.44, and 3.45 about here

Interlique Sentiment

Drawing upon our analysis of the involuntary nature of educational groups at the elementary school level we predicted that our effective-efficient groups would have less interclique negative sentiment. We operationalized this hypothesis by looking at the mutual choice of the two most popular members of each class. These data were then placed on a five point scale (4 = mutual choice to 0 = mutual rejection). The data are in partial support of the hypothesis. As apparent in Tables 3.46 and 3.47 our major phenomenon was the high degree of mutuality of positive choices among the popular members of each group. In the lower socio-economic sample the "E" classes have significantly higher interclique sentiment than the "I" classes. In the middle socio-economic sample there is no difference between the groups.

Insert Tables 3.46 and 3.47 about here

Table 3.42

Differences in Positive Sentiment Concentration in the "I" and "E" Groups in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	2.9	1.8	-1.1	-8	8
2	1.4	3.0	1.6	11	
3	1.2	2.0	.8	3	
4	1.6	2.6	1.0	6	
5	2.0	2.2	.2	1½	
6	3.8	2.4	-1.4	-9½	9½
7	1.8	3.6	1.8	13	
8	2.0	2.2	.2	1½	
9	3.1	2.1	-1.0	-6	6
10	.7	1.7	1.0	6	
11	1.2	2.9	1.7	12	
12	2.0	1.1	- .9	-4	4
13	2.3	.9	-1.4	-9½	9½

T = 37
N = 13
p = N.S.

Table 3.43

Differences in Positive Sentiment Concentration in the "I" and "E" Groups in the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	2.1	3.4	1.3	8	
2	1.0	2.2	1.2	6	
3	2.2	2.7	.5	3	
4	1.9	2.3	.4	2	
5	2.8	3.4	.6	4	
6	1.7	2.9	1.2	6	
7	2.5	2.5	0	Omitted	
8	1.9	2.1	.2	1	
9	1.7	3.1	1.4	9½	
10	.9	2.1	1.2	6	
11	.9	2.3	1.4	9½	

T = 0
N = 10
p = <01

Table 3.44

Differences in Negative Sentiment Concentration in the "I" and "E" Groups in the Lower Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	2.3	2.2	- .1	-2	-2
2	2.3	2.3	0	Omitted	
3	.9	2.0	1.1	9½	
4	1.4	2.6	1.2	11	
5	2.8	1.7	-1.1	- 9½	-9½
6	1.7	1.6	- .1	- 2	-2
7	1.5	2.2	.7	8	
8	1.8	1.6	- .2	-4	-4
9	2,2	1.9	- .3	-5	-5
10	.3	.7	.4	6	
11	1.1	2.9	1.8	12	
12	1.3	.8	- .5	-7	-7
13	1.0	1.1	.1	2	

T = 29
N = 12
p = N.S.

Table 3.45

Differences in Negative Sentiment Concentration in the "I" and "E" Groups in the Middle Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	1.3	2.2	.9	6½	
2	.9	1.2	.3	1	
3	1.2	2.1	.9	6½	
4	1.5	2.2	.7	5	
5	1.4	3.2	1.8	10	
6	2.4	2.8	.4	2½	
7	2.4	2.4	0	Omitted	
8	1.5	2.1	.6	4	
9	2.6	3.0	.4	2½	
10	.7	2.2	1.5	9	
11	1.1	2.2	1.1	8	

T = 0
N = 10
p = <.01

Table 3.46

Differences in Interclique Sentiment in the "I" and "E" Groups in the Lower Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	4	3	-1	-4½	-4½
2	3	4	1	4½	
3	3	4	1	4½	
4	3	4	1	4½	
5	4	4	0	Omitted	
6	2	4	2	9½	
7	3	4	1	4½	
8	3	4	1	4½	
9	3	4	1	4½	
10	2	4	2	9½	
11	4	4	0	Omitted	
12	2	2	0	Omitted	
13	4	3	-1	-4½	-4½

T = -9
N = 10
p = < .05*

---

* On the sign test, p = .055

Table 3.47

Differences in Interclique Sentiment in the "I" and "E" Groups in the Middle Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	4	4	0		
2	4	4	0		
3	4	2	-2	-4	
4	4	3	-1	-2	
5	3	3	0		
6	4	3	-1	-2	
7	3	3	0		
8	4	4	0		
9	4	4	0		
10	3	3	0		
11	3	4	+1	+2	+2

T = +2
N = 4
p = N.S.

Congruence In Social Ranking

As we have reasoned in our theoretical discussion we predicted that social rankings on several dimensions would be more congruent in the "E" classes than in the "I" classes. Operationally we utilized peer nominations. Proceedurally, we developed a hierarchy on each dimension in each classroom group. Each ranking was then intercorrelated with every other ranking. The fifteen correlations of "I" class were then compared with the matched "E" class for a simple judgment concerning the degree of congruence. In the initial analysis a large amount of data were summarized by simply reporting the frequencies in which the number of correlations are greater in the "E" groups than in the "I" groups. These data are in Table 3.48. The hypothesis is not supported in either sample, although the direction is the same in both and the combined probability is at the .15 level.

Insert Table 3.48 about here

A second analysis using the more applicable Wilcoxon signed rank test suggests that the interpretation of the findings should be no difference between the "I" and "E" classes*. The hypothesis is not tenable. These data are in Tables 3.49 and 3.50.

Insert Tables 3.49, 3.50, and 3.51 about here

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* Both analyses are presented because an earlier report and misinterpretation had been made using only the data from the sign test.

Table 3.48

Frequence of Greater Social Ranking Congruence in "I" and "E" Classes for Each Socio-Economic Sample.

Socio-Economic Sample	Frequency of Greater Congruence "I"	"E"	p
Low SES	5	8	.29
Middle SES	4	7	.27
	9	15	.15

Table 3.49

Difference in Social Rank Congruence in "I" and "E" Classes in Lower Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with Less Frequent Sign
1	6	9	3	2	
2	0	14	14	12	
3	3	12	9	6½	
4	4	10	6	5	
5	12	3	-9	-6½	-6½
6	2	12	10	8	
7	10	5	-5	-3½	-3½
8	15	0	-15	-13	-13
9	2	13	11	10	
10	6	8	2	1	
11	2	13	11	10	
12	13	2	-11	-10	-10
13	10	5	-5	-3½	-3½

T = 36½
N = 13
p = N.S.

Table 3.50

Differences in Social Rank Congruence in "I" and "E" Classes in Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	3	12	7	3	
2	4	10	6	5	
3	6	8	2	1	
4	11	4	-7	8	-8
5	12	3	-9	11	-11
6	10	4	-6	5	- 5
7	4	10	6	5	
8	11	3	-8	10	-10
9	5	10	5	3	
10	4	11	7	8	
11	6	9	3	2	

T = 34
N = 11
p = N.S.

Table 3.51

Differences in Social Rank Congruence of "I" and "E" Classes using Both Socio-Economic Samples/

Teacher	Difference	Rank of Difference	Rank with less Frequent Sign
1	7	13	
2	6	9½	
3	2	1½	
4	-7	-13	-13
5	-9	-17	-17
6	-6	-9½	-9½
7	6	9½	
8	-8	-15	-15
9	5	6	
10	7	13	
11	3	3½	
12	3	3½	
13	14	23	
14	9	17	
15	6	9½	
16	-9	-17	-17
17	10	19	
18	-5	-6	- 6
19	-15	-24	-24
20	11	21	
21	2	1½	
22	11	21	
23	-11	-22	-22
24	- 5	- 6	- 6

T = 129½
N = 24
p = N.S.

Congruence of Motives and Esteem

In our theoretical discussion we argued that congruence in social motivation and social ranking-esteem should produce a higher level of group functioning. As we indicated we operationalized social motives with a TAT type set of pictures and social ranking or esteem with sociometric nominations. For our analyses we constructed a two by two matrix (presence or absence of imagery and high and low in rank) and made a frequency count of the number of individuals who fell in the high-high and low-low quadrants. We then compared these percentages between our "I" and "E" classes and computed the Wilcoxon T values.

The major outcome of the analysis is that congruence of motive and esteeem is unrelated to effectiveness and efficiency. The data for achievement motivation and esteem -- best achiever in arithmetic or social studies -- are presented in Tables 3.52 and 3.53. In neither sample is the hypothesis confirmed. The frequency pf achievement motivation in the lower s.e.s. classes was so low as to preclude an adequate test of the hypothesis.

Insert Tables 3.52 and 3.53 about here

The hypothesis that congruence in affiliation motivation and popularity esteem is related to effectiveness and efficiency, is also not supported in either socio-economic sample. The trend is in the same direction in each sample and approaches significance overall. ($p < .15 > .10$). Data are in Tables 3.54 and 3.55

Insert Tables 3.54 and 3.55 about here

Tables 3.56 and 3.57 contain the test of the congruency hypothesis with the power motive and attributed power rank. As with the other motives the congruency hypothesis is not confirmed.

Insert Tables 3.56 and 3.57 about here

Table 3.52

Differences in Congruence of Need Achievement and Achievement Esteem in the "I" and "E" Classes of the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	67	45	-22	9	
2	54	53	- 1	1	
3	67	91	24	+11	+11
4	50	55	5	+4½	+ 4½
5	70	73	- 3	3	
6	48	73	25	+12	+12
7	50	35	-15	7	
8	67	50	-17	8	
9	67	62	- 5	4½	
10	67	67	0	Omitted	
11	33	46	13	+ 6	+ 6
12	75	73	- 2	2	
13	73	50	-23	10	

T = 33
N = 12
p = N.S.

Table 3.53

Differences in Congruence of Need Achievement and Achievement Esteem in the "I" and "E" Classes of the Middle Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	44	55	11	6½	
2	50	56	6	3	
3	67	58	-9	-5	-5
4	50	55	5	1½	
5	60	43	- 17	-9½	-9½
6	56	48	- 8	-4	-4
7	67	72	5	1½	
8	30	47	17	9½	
9	46	60	14	8	
10	50	61	11	6½	
11	75	47	-28	-11	-11

T = -29½
N = 11
p = N.S.

Table 3.54

Differences in Congruence in Affiliation Motivation and Popularity Ranking in the "I" and "E" Classes in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	50	64	14	6	
2	29	29	0	Omitted	
3	44	56	12	4½	
4	42	75	33	11	
5	42	30	-12	4½	-4½
6	43	36	-7	3	-3
7	33	53	20	8	
8	53	56	3	1	
9	56	30	-26	9	-9
10	50	44	-6	2	-2
11	50	50	0	Omitted	
12	25	54	29	10	
13	65	50	-15	7	-7

T = 25½
N = 11
p = N.S.

Table 3.55

Differences in Congruence in Affiliation Motivation and Popularity Ranking in the "I" and "E" Classes in the Middle Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	44	41	-3	-1	-1
2	57	73	16	6	
3	33	42	9	3	
4	62	11	-51	11	-11
5	80	61	-19	-7	- 7
6	44	67	23	8	
7	50	41	-9	-3	- 3
8	10	50	40	9	
9	18	60	42	10	
10	33	46	13	5	
11	62	71	9	3	

T = -22
N = 11
p = N.S.

Table 3.56

Differences in Congruence in Power Motivation and Attributed Power Rank in "I" and "E" Classes in the Lower Socio-Economic Sample.

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	40	55	15	9	
2	53	41	-12	6½	-6½
3	67	45	-22	11	-11
4	41	50	9	4½	
5	53	40	13	8	
6	67	55	-12	6½	-6½
7	50	41	-9	4½	
8	60	44	-16	10	-10
9	33	38	5	3	
10	33	61	28	13	
11	50	46	-4	1½	-1½
12	50	54	4	1½	
13	36	62	26	12	

T = -35½
N = 13
p = N.S.

Table 3.57

Differences in Congruence in Power Motivation and Attributed Power Rank in "I" and "E" Classes in the Middle Socio-Economic Sample

Teacher	I	E	Difference	Rank of Difference	Rank with less Frequent Sign
1	33	48	15	7	
2	67	73	6	4	
3	67	63	- 4	3	-3
4	50	38	-12	6	-6
5	40	43	3	1½	
6	33	62	29	11	
7	42	60	18	9	
8	70	53	-17	8	-8
9	73	45	-28	10	-10
10	62	69	7	5	
11	50	43	-3	1½	-1½

T = -28½
N = 11
p = N.S.

SUMMARY AND CONCLUSION

In summarizing and concluding the report of the classroom study we will raise two specific points: 1) the sense of the data as they relate to our hypotheses and with special consideration of the socio-economic replication and 2) future directions for new work.

The Sense of the Data

If we were to build a chart in which the left hand column contained a list of the pairs of classroom groups, and the remaining columns contained each of the variables which are related significantly to effectiveness and efficiency then we could approximate a mosaic of classroom functioning. Within each of the cells a check mark indicating major differences between a pair of classes would suggest explanations for the functioning of the groups. Actually such a chart reveals the interdependency of many of our variables. Typically each classroom has multiple effects related to the differences.

Insert Figures 3.4 and 3.5 about here

As we look at the summary matrix for the middle socio-economic sample difficulties in classroom functioning center significantly on what we have called individual qua group variables. As classroom groups are formed with individuals of lower intelligence, less adequate mental health and smaller frequencies of need achievement, difficulties arise in making these groups into effective and efficient classes. As we have indicated in our theoretical discussion, while such results are important they suffer because they are not "manipulable" by the teacher in her day-to-day work with children. The "E" classes perceive the teacher as more considerate than do the "I" classes. The source of these differences in perceptions, the causal direction -- or mutual dependency of consideration and effectiveness and efficiency -- and the interplay of pupil-teacher interaction over time can only be suggested from our data.

The several sentiment structure variables seem very intriguing. The unanimity in the eleven pairs of classroom groups in sentiment concentration both positive and negative suggest potentially very important phenomena. While one can label this "mature sociometric patterning" and speak of "responsible pupil leadership" and so forth, it is also possible to speak of "status hierachies" and low prestige to the degree that "scapegoats" are present. More intensive analysis of these aspects of the internal system of the pupil group is needed. Finally the overall sentiment-cohesiveness of the "E" groups fits neatly with our predictions.

Figure 3.4

Summary Matrix: The Sense of the Date in the Lower Socio-Economic Sample

Teacher	Intelligence	Mental Health	Affiliation Motivation	Sentiment Ambivalence	Sentiment Interclique
1		X			
2		X		X	X
3	X	X	X		X
4	X		X		X
5	X				
6			X		X
7	X		X		X
8		X			X
9				X	X
10	X	X	X	X	X
11	X	X		X	
12				X	
13				X	

Figure 3.5

Summary Matrix: The Sense of the Data in the Middle Socio-Economic Sample

Teacher	Intelligence	Mental Health	n Ach	Consideration	Discrepancies in Consideration Participant and Expectations	Sentiment Cohesiveness	Positive Sentiment Concentration	Negative Sentiment Concentration
1		X	X			X	X	x
2	X			X	X	X	X	
3	X		X					X
4			X					
5		X				X		X
6				X	X		X	
7	X	X						
8	X	x	x	x	x	x		
9	X	X					X	
10			X				X	X
11			X	X	X		X	X

The mosaic in the lower socio-economic groups seems less satisfying. We have barely begun to satisfy ourselves as to an "educational psychology of the classroom of the culturally deprived." One of our major findings, as we indicated earlier, concerns the intelligence concept. While no one today sees an IQ as an indelible genetic birthmark, there are frequent implications that it is a meaningless or near meaningless concept with culturally deprived children. Our data suggest that "good groups", our high productive and high morale classes--as defined by the teacher--are brighter than the "poor groups". This finding held in the middle class schols. It was equally true in the lower class schools. Regardless of the source of the ability and regardless of the possibility of changing the ability, it, as reflected on thirty five minute Otis instrument, is important. Similar results occurred with the mental health variable. Although the mental health variable has often been linked with social class biases, our data indicate that differences in pupil mental health produce differences in classroom functioning.

The remaining differences in the "I" and "E" classes occurred in need affiliation and sentiment ambivalence and interclique sentiment. The "good" classes contained more individuals with needs to develop and maintain interpersonal relationships, while the "poor" classes had considerably less mutuality of friendship among popular children and more expressions of dislike toward other children in the group. Our data give no indication as to the way in which these sentiment structures arose, i.e. are they brought in from previous years or are they a product of the particular sequence of events for the year.

The similarities and differences between socio-economic areas as we have commented upon paritially I.Q. and mental health are important in both areas. The constrasting impact of need affiliation and need achievement in the two s-e-s levels makes sense, although we had not made a differential prediction. If such findings, need affiliation relating to effectiveness and efficiency in lower s-e-s classrooms and need achievement relating to effectiveness and efficiency in the middle s-e-s classrooms, hold up with replication a whole series of questions can be raised. Similarities and differences in school goals, kind of norms regarding classroom behavior and school activities in non school hours (homework, reading, etc.), teacher strategies for working with the children, kinds of materials and activities suggest some of the viable interrelationships. At this point we don't have a rationale for the interclique conflict which was important in the lower s-e-s classrooms but not in the middle s-e-s classrooms. Nor do we understand the significance of the difference in the sentiment concentration which was very important in the middle s-e-s schools but unimportant in the lower s-e-s schools.

Teacher Leader Behavior

The results of the leader behavior predictions were so contrary to our predictions and to some of the earlier findings (Smith and Johnson 1962, Smith and Lutz, 1963) that more extended discussion seems warranted. We will speak first to the data, second to the methodology and third to the theory.

One of the most striking findings concerned the differences in perceptions and expectations of teacher consideration. Pupils, regardless of social class and regardless of the level of functioning ("I" or "E") perceive the teacher as providing less consideration than they expect. Why this should be so in forty four groups is not clear. Whether its significance lies in a broader context of child-other relationships, child-adult relationships, or child-authority relationships is not clear. It is clear though that the discrepancies between perceptions and expectations are not related in a simple way to effectiveness and efficiency. In the middle class the hypothesis held.

In the lower socio-economic sample, the trend of discrepancies in perceived and expected Consideration was reversed. Contrary to our prediction the "E" classes tended toward greater discrepancy. Also contrary to our predictions, the same phenomenon seems to be occurring regarding teacher Initiating Structure. If we had entered the problem non theoretically, "I wonder if the groups will differ one way of the other" rather than theoretically, "I think the "E" groups will be less discrepant for reasons, then we would have been rewarded with significant differences. The problem we have is fascinating in that our theory was not supported and we have the anomaly that for both variables, Consideration and Initiating Structure, the trend is *contrary* to the hypothesis in this lower socio-economic sample of classes. The question we would pose is, Do we have a chance set of events or is this an important and significant aspect of teaching in culturally deprived areas ? Theoretically, this is a most difficult question. What is the nature of lower social class, of low socio-economic status, or cultural deprivation? Does a teacher in such a community make a kind of resolution with the duller, and the less mentally healthy which leaves an "E" class full of internal conflict i.e., discrepancies in their perception and expectations of both her Consideration and Initiating Structure? At this point we cannot conceptualize the relationship of cultural deprivation and the classroom social system.

Briefly we would comment on the methodology of our experiment. The decision to utilize the split level (e.g. 5H and 6L) elementary classes which were being taught by the same teacher at the same time and in the same place may have accented the importance of the "individual qua group" variables. How much the teacher can, will, or does vary her behavior from group to group is open to serious question. A better test of the hypotheses might well have been in junior high or senior high school classes which were completely independent of one another.

The use of criteria, i.e., operational definitions of effectiveness and efficiency, other than teacher nominations, seems necessary also. For instance, the perceptions of principals concerning teachers, teacher's general reputations among the pupils, formal gains in specific cognitive and affective objectives and so forth seem like productive leads as other criteria for our teachers, as perceived by the children, did vary markedly in the two LBDQ scales. Such variability, however, was not related neatly to our criterion.

Theoretically several problems seem in need of analysis. The first, and perhaps the most important is the nature of the concepts Consideration and Initiating Structure. Originally we had approached these as roles that were played by the teachers. Conceptually, there is needed a bridge between organizational theory from which these concepts seem most directly derived -- this derivation originally was empirical and still remains implicit theoretically -- and the small group theory from which most of our thinking has come.

A second kind of clarification needed is a distinction between some "objective" indication of what the teacher "does" and what she is perceived to be doing. There is the implicit assumption that the LBDQ measures what she does do rather than what she is perceived to be doing. More strictly, it is a "direct" measure of perception and an indirect measure of "actual" behavior. While this is the validity problem faced by almost all psychological measures, the problem becomes more complicated here because our theory would suggest that an individual's perception of another's behavior is an important dependent variable in its own right and not just an indirect measure of an independent variable.

What the teacher "really does" is a most important and complex problem in its own right. For instance, if an educational psychology is to have something to say to the classroom teacher, it must be able to specify behavior on her part, under her control, which will lead to altered pupil perceptions, and then to altered pupil behavior. But, what she "really does" can be assessed at varying levels of specificity and generality, the long-standing molecular-molar controversy. For instance, it is possible to develop observational checklists and tally minute items of teacher cognitive behavior -- as Wright and Procter (1961) have done or minute items of social influence behavior as Flanders (1962) has done. It is possible also to develop observational systems to tally larger items of teacher behavior, climate and competence as Cornell, Lindval, and Saupe (1953) have done. Our comments, at this point, are not to suggest a resolution of just what the teacher does but to suggest that the problem is important, complex, and theoretical.

Finally, we would argue that the reasoning in which we engaged, and which is indicated in the theoretical section of the chapter must be extended and "tightened" considerably. Our interpretation is that the miniature theory approach of Zetterberg (1954) or the middle range theory approach of Merton (1957) suggests the style and rigor needed if teacher behavior is to be understood in relation to the functioning of classroom groups.

Further Directions

In a project such as this wherein so many variables have been introduced and so many interesting findings have occurred it is difficult to suggest an initial point of departure. None-the-less we would introduce two basic guidelines. First, we are impressed wih the need for building a theory or a set of miniature theories which interlock and which will handle systemmatically, i.e. in logically interrelated propositions, all of the variables which we have seen as "loosely generated" by our experience and our concern with Homans' conceptions of human groups and their functioning. As we argue in Chapter Four this kind of rigor is an important key to solving such problems as the relationship between laboratory and classroom research and the relationsip between research and the art of teaching. This kind of rigor is the definition of "putting order into one's ideas."

A second aspect of further directions, while possessing some obvious relationships to the previous suggestion, has importance in its own right. This concerns the teacher's conception of her classroom group. As we have indicated when we originally planned this investigation we were concerned with the problems of group functioning--effectiveness and efficiency. We operationalized these group concepts through ratings by teachers of their classes. At this point we perceive that this "mode of measuring" contains considerable importance in its own right as a conceptual variable. Only after we had more carefully thought through the assumptions underlying the use of these ratings did we realize the number of factors--besides group effectiveness and efficiency--which might make a contribution to the final judgment marked down by the teacher. The study of these judgments is but one part of a very broad problem, the way in which a teacher thinks about her classroom group. And this in turn might be considered a portion of a problem we would call "Teacher strategies and the classroom social system". By this we mean 1) what ideas or concepts does the teacher have about her children, the institutional responsibilities, and her own personality 2) how does she initially perceive the specific group of children she receives 3) how does she then act toward and with the group 4) how do they respond 5) what cues does she then pick up 6) how does she then reconceptualize the totality and then commence another series of actions.

A concern for such "strategies" immediately moves away from a study of group structure, such as we have carried out here, toward a study of group processes or group dynamics. This seems to be a quite fruitful point of departure for several reasons: 1) It suggests to a new teacher or a teacher with a new group the sequential aspects of "working with" or developing a group toward effectiveness and efficiency. 2) It suggests influences which have causal rather than just correlative implications. 3) It suggests manipulable variables, ones that a teacher "can get her hands on" to effect change. This is at the heart of the concern we've already raised at length in our discussion of the limitations of the "individual qua group variable" for the teacher interested in the practical business of altering a group. And finally, 4) it suggests an intriguing possible synthesis with Skinnerian learning theory. This is most important because most learning theories are not couched in terms of what Skinner would call "control" but are couched in terms of post factum explanations. Since individual learning is one of the obvious "ultimate criteria" of classroom functioning the similarity in these conceptions seems most fruitful for next steps.

A final point of direction for forther work really is an alternative suggested by the sequential model which we present and develop in Chapter Four. There is a need for moving into more clinical or anthropological field study and a need for more careful instrumenting and controls as found in the laboratory. Both of these seem quite viable and important. The former could give more of the context of the variables and more conceptual clarity as we have been suggesting. The latter could through more careful concern with instruments, manipulations, and the control of alternative hypotheses specify important aspects of the problem with which we have been dealing--especially as we have indicated the problems underlying the lack of support of the teacher leader behavior hypotheses.

Chapter 4

Observations and Reflections:

The Proper Integration of Laboratory and Classroom Research

One of the important project problems we wanted to see more clearly centered on the interrelationship between laboratory and field research in the analysis of educational problems. As we have indicated in Chapter One the two aspects of this project were conceived semi-independently, that is they derived from earlier separate work, but we had been close colleagues in that earlier work. We fused the two projects into one proposal because of the similarities in many of the variables under investigation. We carried out successfully both phases of the project as has been reported at length in Chapters two and three of this report. We would present a number of observations on this joint enterprise.

As we view our experiences in carrying out this project, the simple division of laboratory and classroom research was a much too simple conceptualization. This aspect of our problem really contained the following dimensions.

1. Individual vs team (dyadic) research.
2. Small group vs large group research.
3. Artifically contrived vs naturalistic groups.
4. Projected vs ex post facto experimental research.
5. "One shot" demonstration research vs "sequential" research.
6. Theoretical vs non-theoretical research - and the "gray inbetween."

Limits and Sequences of Actions

In his recent book, Zetterberg comments: "The simplest law of sociology is the principle of the limit of actions-- The number of possible actions per person is limited" (Zetterberg, 1962 p. 74). We would juxtapose this with our observation: A focus on the sequence of actions is neglected by most individuals. These two generalizations sum up our most important experiences in connecting the laboratory and field aspects of the project. As our proposal was written we were involved in two verification studies; both were quite comprehensive, and both were scheduled to occur at the same time. The broadness led us to assign responsibility, engage in a division of labor, one phase to one person and the second phase to the other. Also our prior interaction in the beginning of writing an educational psychology textbook together, (Smith and Hudgins, 1963), had taught us that this could be a fruitful mode of work. In that work each individual wrote a series of chapters and the other individual raised extensive criticisms and did some rewriting. The first individual made the final decisions--usually with high mutual agreement--and rewrote "his" chapters. In the end the chapters became a joint product in the best sense of the term.

Similar attempts were carried out in this research project. Each of us took responsibility for one part, raised the conceptual framework, design, and time schedule. The other reacted critically and constructively. The experimental procedures were formalized. Joint efforts occurred in phasing data collections to insure maximum return on time available. The classroom data were obtained and the small groups were run in the same six month span.

A neglect of focusing on the possible sequence of research events resulted from those procedures. First, the conceptualization of research as "one shot" affairs, part of which is stimulated by the "contract" type of support from the Cooperative Program and part of which was stimulated by our own research naivete was a most serious error. In both the laboratory and the naturalistic studies we were looking at conceptually and practically important group structural variables. After seeing how they functioned in the classroom, we should have taken them into the laboratory for a more careful assessment. Or, the variable might have been explored in depth and with the experimental rigor possible in the laboratory, then its analogue sought and investigated in the on going field setting. At this point we are not sure which time sequence would be most profitable. We are convinced, as much as one should be with a single case for evidence, and with some reservations which we will present shortly, that either sequence, as long as it's a true sequence, is preferable to the procedure we followed.

A further aspect of the problem of limit of possible actions concerns the situation and developing interests of the principal investigators. Carrying a half to full time teaching load, plus the high individual autonomy of the investigators caused each of us to branch out into other areas during the course of the investigation: Hudgins' developing interests in "classroom learning" and Smith's pursuit of "teacher strategies" suggest these directions. They also suggest a problem in the very real need to maintain some independent self identity apart from the close cooperation necessitated by the textbook and by the project. This also prevented total integration of the two aspects of the project.

The Major Advantage of the Joint Research

The major advantage of the joint aspect of the project actually lay in a very simple phenomenon. With the great degree in commonality of the concepts under study, it was possible to gather in one entry the data on ability, achievement, motives, and traits which were vital to both aspects of the project. This simplified--and any research worker utilizing public school children should not negate it--the frequency of administrative contracts and approval, the number of principals, and teachers whose busy schedules would be interrupted, and the amount of instructional time taken from the children's course of study. All of these are very sensitive issues of bureaucracy, public school policy, and personal cooperation.

Theoretical, non theoretical, and the gray in between

Another, and very important, issue latent in the integration of laboratory and field studies concerns the proper role and use of theory. Our experience suggests a number of phenomena. First, and by way of background, each of us tends to come from an applied tradition: one out of a teacher training program and one out of the heart of "dust bowl empiricism". We are currently working in a Graduate Institute of Education which possesses an evolving set of norms, to which we subscribe and to which we contribute, accenting "theories of the middle range". Part of our support for this institute position comes from our experience with this project. When each of the projects was designed both investigators had already moved toward a position that educational research should emanate from more general ideas and from important classroom issues. Each of the problems did. To this degree the problems were theoretical and they were practical. However, and it was not until the designs were pretty well "frozen" that we became sufficiently aware that any real synthesis of "laboratory" and "classroom" research must come at a theoretical level.

This of course raises the questions, What is theory?, and more particularly, What is educational theory? In our more cynical moments our reactions have been two fold: 1) no one in education is very clear about this, and 2) each person believes his own approach is theoretical, but what each person does when he is being theoretical is quite different from the other person.

Our experience, partly in the project and partly in interaction with our colleagues, would suggest several critical observations. First, having a "rationale" or some general ideas from which the research emanated or was "loosely linked to" is not being theoretical but is in the "gray-inbetween". Second, and perhaps this is but a further specification of the first point, just because the concepts under investigation belongs to the system of some "authority" in education, psychology, or sociology one is not being theoretical. Third, the specification of conceptual and operational definitions of one's variables does not make a piece of research theoretical, although this is an important aspect of research. Fourth, clarity of operational concepts through factor analysis or building homogeneous scales while also important in the research process,' is also not the core of being theoretical. Fifth, careful statistical design and use of appropriate tests while important in research is also not the crux of the theoretical issue.

To us, and here we draw heavily upon Ryans (1956) and Zetterberg (1954), and particularly the latter, both of whom incidently owe much of their thinking to Rose (1950), the crux of being theoretical lies in the axiomatic method.* The ingredients are essentially quite simple to talk about, but quite difficult to carry out. First, one must select several "primitive" or undefined terms and from these generate a series of "derived terms" whose meaning is tied to the limited number of primitive terms. These terms or concepts are then interrelated into a series of propositions some of which become postulates for which you have prior data as support and others become hypotheses requiring investigation. In any actual experiment, the working hypothesis may involve an independent variable which is logically two or three steps removed from the dependent variable. A realization of this "three-step" removal becomes very important, as we have indicated in part in chapter three, when trying to understand why a hypothesis was not supported.

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* Neither of the investigators was aware of these papers before our research began.

Actually, an applied social theory, the kind toward which we are working, might well arise much more "inductively" than the above paragraph would suggest. One may have a variable such as effectiveness that one is interested in ,as we did, and speculate about phenomena which might be related to it. Such variables as intelligence or ascendency influencing effectiveness are illustrative. Theory enters in when one specifies the chain of "if-then" propositions which lie between the independent and dependent variables. The terms require careful conceptual or nominal definitions (to use Zetterberg's words); the propositions must be logically related.

For the integration of any laboratory and classroom research this careful analysis must occur in each area and the concepts must be co-ordinated. Often superordinate concepts must be [illegible] invented. In essence this is a case of the more general problem of whether any two pieces of research regardless of the environmental locus, laboratory or classroom, in which they have been carried out, can be described as addressing themselves to the same issue. In joint efforts such specification must be done early and must be done sequentially. Unfortunately, as we have suggested, educational research frequently does not follow this pattern. It is our understanding that this is what Conant (1953) meant in discussing degrees of empiricism and the "other element" in modern science:

> Now, systematized or well ordered empirical inquiries are one element in the advance of science; the other element is the use of new concepts, new conceptual schemes that serve as working hypothesis on a grand scale. . .The essential element in the advance of modern science has been the curious interplay between such theoretical notions and the experimentation of the artisan; through such an interplay scientists have built up a fabric of interconnected concepts and conceptual schemes. (p.).*

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* This quotation was suggested to us by W. W. Charters.

In conclusion it might be helpful to schematize some of the methodological issues with which we have been dealing. These schemas owe much to the discussions by Zetterberg (1954, 1960), to the Graduate Institute of Education "Metatheory Seminar", and to extended conversations with out colleagues, especially Professors Charters and Iannaccone. The models, Figures 4.1 and 4.2, attempt to link clinical practice, theory, and research. In this sense it represents our growing understanding of the latent dimensions that really existed in our first posing the question of the relationship between classroom and laboratory research.

Insert Figures 4.1 and 4.2 about here

The models make these points

1. Clinicians working with individual cases, be they a pupil, a classroom, a building, a school system, or other kinds of cases must conceptualize their activities. The able ones at this become Chester Barnards and John Deweys.

2. The researchers, in laboratories, classrooms, factories, etc. must conceptualize their activities. The able ones at this become Thorndikes, Lewins, and Malinowskis.

3. The model suggests that the connection between research and practice must come through theory.

4. A number of inventions have been attempted to bridge this gap between research and practice. Such phenomena as action research, authoritative advice to practitioners, and inservice reports on current research are innovations which have not solved this problem well. In so far as they have worked, we would argue, and this is proffered as a working hypothesis, their success depends on the degree to which the researchers and practitioners have conceptualized their events into a common theoretical framework.

5. Our initial problem, the differences between laboratory and classroom research, becomes a special case of this larger problem. Even though an instance of this more general problem a number of questions concerning significance of variables, ability to manipulate, control of alternative hypotheses, and so forth, are raised which need careful study. Both the laboratory and the field contain almost all combinations of these with certain advantages accruing to each locus of endeavor.

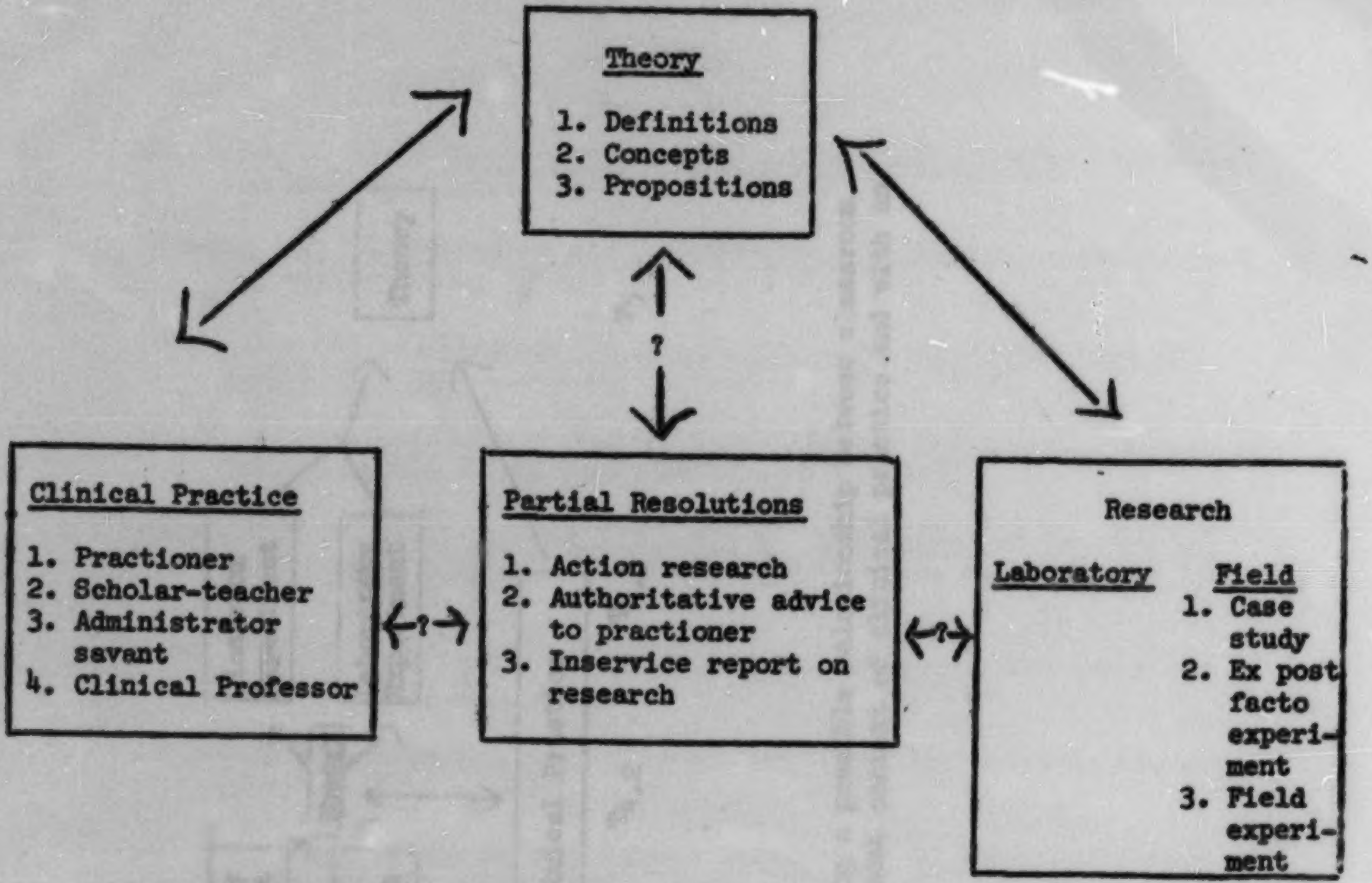
Theory
1. Definitions
2. Concepts
3. Propositions
?
Clinical Practice
1. Practioner
2. Scholar-teacher
3. Administrator savant
4. Clinical Professor
?
Partial Resolutions
1. Action research
2. Authoritative advice to practioner
3. Inservice report on research
?
Research
Laboratory
Field
1. Case study
2. Ex post facto experiment
3. Field experiment

Figure 4.1 Schema indicating latent question and a resolution to the original problem on the relationship of laboratory to classroom research.

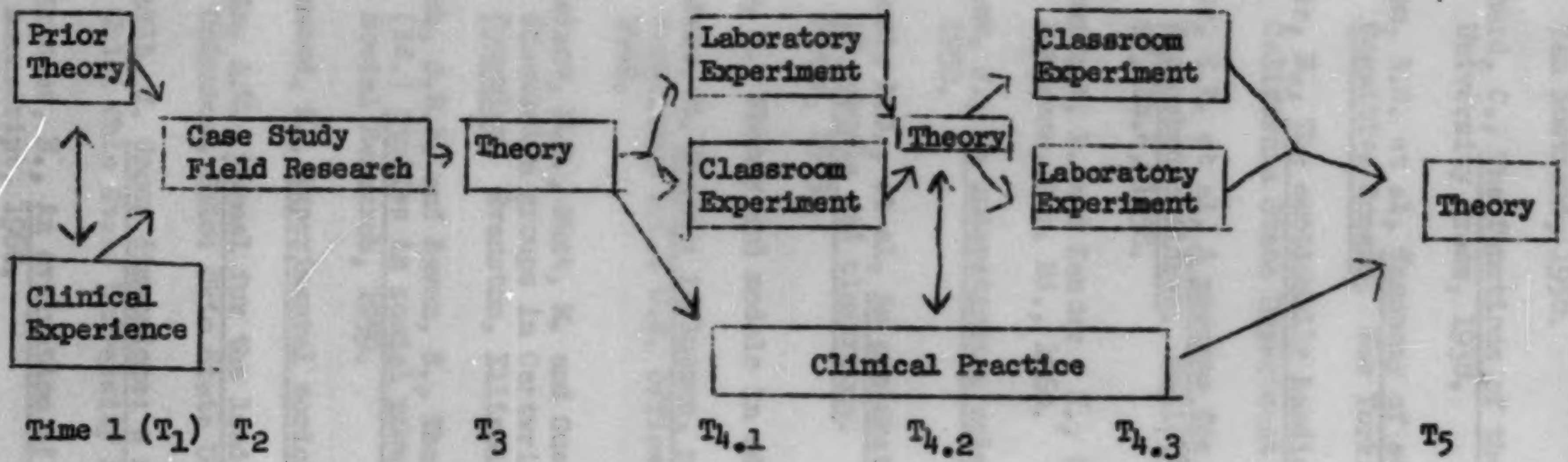
Prior Theory
Clinical Experience
Case Study Field Research
Theory
Laboratory Experiment
Classroom Experiment
Theory
Clinical Practice
Classroom Experiment
Laboratory Experiment
Theory
Time 1 (T_1)
T_2
T_3
$T_{4.1}$
$T_{4.2}$
$T_{4.3}$
T_5

Figure 4.2 A sequential or process model indicating a possible relationship between classroom and laboratory research within the broader context of clinical practice and with an accent on the importance of theory.

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